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HACKERS,
AND SPAM...**

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Portégé® M200 Tablet PC

Innovation Inspired hinge design allows display to pivot smoothly for effortless transformation from notebook to tablet PC

Clarity Crisp high-resolution 1400x1050 display with NVIDIA® GeForce™ FX Go5200 graphics and high-density digitizer for precise handwriting recognition

Agility Internal accelerometer senses the tablet's rotation and adjusts the screen orientation automatically

Power Intel® Centrino™ Mobile Technology enables desktop performance with notebook portability

Productivity Inking function allows handwritten edits on shared documents, encouraging collaboration

Flexibility Optional Tablet Multi Dock supports notebook, desktop and tablet functionality

Acclaim *Editors' Choice* - PC Magazine February, 2004
Editors' Choice Award - LAPTOP January, 2004
Editors' Choice Award - CNET March, 2004

TOSHIBA



**Toshiba recommends
Microsoft® Windows® XP
Professional for Business.**



Portégé® M200 Tablet PC Superior engineering. Superior performance.

Intel® Centrino™ Mobile Technology

- Intel® Pentium® M Processor 1.50GHz
- Integrated Wireless LAN:
Intel® PRO/Wireless Network
Connection (802.11b/g)⁴
- Intel® 855 Chipset

Microsoft® Windows® XP Tablet Edition
Microsoft® Office OneNote™ 2003
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512MB DDR SDRAM
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NVIDIA® GeForce™ FX Go5200
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1-Year Battery⁵

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Toshiba Tablet Multi Dock \$379

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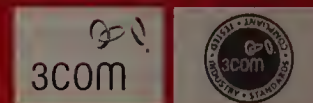
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3Com Router 3016

- One 10/100BASE-T, one T1/CT1/PRI (with integrated CSU/DSU), one Console, and one AUX serial port
- High-speed processor addresses remote connectivity, routing and security needs
- Advanced QoS and traffic management capabilities for converged voice, data, and video
- Advanced security and control features protect sensitive client and company data



\$629⁷³
CDW 547509



\$65²³
CDW 585641



Targus Deluxe 17" Leather Notebook Case

- Notebook compartment with protective nyflex lining fits notebooks with up to 17" screens
- Front zip-down workstation houses business card holder, key clip, pen logos, accessory pockets and file section
- Removable, mesh accessory pouch
- External mobile phone pocket



\$999⁹⁹

CDW 563463



Xerox Phaser 8400B

- Up to 24ppm color and black and white
- 128MB standard, 512 max
- Network optional
- Up to 85,000 pages per minute duty cycle
- 1 year depot warranty

SimpleTech Bonzai Xpress 256 USB 2.0 Embedded Flash Drive

- Operates at a write speed of up to 60Mb/sec (7.5MB/sec)
- Free Storage Sync software
- Built-In Write Protection Switch



SimpleTech

\$105⁵⁷

CDW 575823



\$649⁹⁹

CDW 573771



Planar PE191M-BK

- Analog and digital inputs combine with a 600:1 contrast ratio to deliver crisp, bright images
- 19" LCD monitor can support computing applications with ease and is powerful enough for video playback or graphics applications
- Integrated speakers and a thin-bezel design saves desktop space
- Backed by Planar's 3 yr Customer First™ warranty

ScanSoft PDF Converter for Microsoft Word V2.0.

- Instantly convert PDF files into Microsoft Word documents and forms
- Generates perfectly editable documents complete with text, columns, tables and graphics
- Superior speed and ease of use from within your favorite applications – Word, Outlook, Windows Explorer, and Internet Explorer



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PC WORLD

J U N E 2 0 0 4
VOLUME 22 ♦ NUMBER 6
AOL KEYWORD: PCWORLD
WWW.PCWORLD.COM

FEATURES

PC SECRETS

98 Who Knew Your... {PC, Software, Camera, Printer, Network, Drive, Handheld} ...Could Do That?

Want to accomplish the unexpected with the system and peripherals that you use every day? Learn about some affordable add-ons, easy tweaks, and quick tricks that can help.

DIGITAL VIDEO

111 DV Stars

Whether you have indie film festival ambitions or more modest goals, new digital camcorders let you shoot superb video and easily port it to your PC so you can create your own DVD.

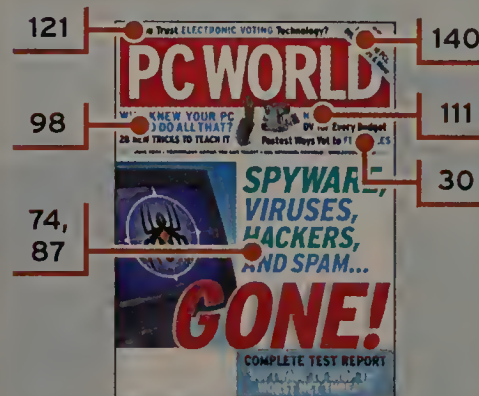


ELECTRONIC DEMOCRACY

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Millions of voters this year will use polling machines based on PC technologies. How do these devices work? What are their security vulnerabilities? We dig up the answers.

ON THE COVER



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ULTIMATE PC PROTECTION

74 Bigger Threats, Better Defense

As the digital landscape grows murkier and more treacherous, new tools evolve to help you repel hackers, viruses, and spyware. We look at 16 candidates to secure your system.

87 Spam-Proof Your In-Box

When you use a spam filter to navigate the e-mail ocean, you want to avoid shoals of spam and whirlpools of false positives. The right software can help you succeed at both.



98

Cover photography by Rick Rizner; photo-illustration by Diego Aguirre.



Finally, an LCD display
that captures the color of life.



The FP951 19-inch LCD display— ultra-high contrast, ultra-high quality.

When you want vibrant color and vivid detail, get the FP951 from BenQ. Featuring an ultra-high 700:1 contrast ratio, a superior A+ LCD panel, and super-wide 170° viewing angle, you'll enjoy crystal clear, recognizable images from multiple viewpoints. An ultra-slim (0.7 inch) bezel design includes analog/DVI input signal. For color that rivals reality, call 1-866-700-2367 or go to www.BenQ.com.

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BenQ

Enjoyment Matters

TOP 100

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TELL US WHAT YOU THINK

Visit www.pcworld.com/pcwinput and rate this issue—you could win a Sony Handicam DCR HC20 digital camcorder, which currently sells for just under \$500. You'll need the subscriber number from your mailing label to take this survey online. The site explains the official rules and also describes how to participate in the drawing if you're not a subscriber. You can enter from May 17 through June 11, 2004.

COMING UP IN JULY

World Class Awards: PC World editors—and industry experts—reveal their top picks of the year.
RSS Feeds: These aggregators come in all shapes and sizes, and serve up the news you want—fast.

Tech Support Status Report: We put vendors to the test to learn what kind of help you can expect.
Cars Go Digital: New devices help you cruise safely, enjoy the ride, and get where you're going.

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NEWS & TRENDS

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Instant messaging—now common in offices as well as homes—is attracting viruses and worms.
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New nomenclature de-emphasizes clock speed.
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The latest models have sophisticated cameras, faster data speeds, and gaming capabilities.
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Ultra Wide Band is blistering—at short range.

NEW PRODUCTS

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- 60 Notebook**
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Plextor ConvertX PX-M402U
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Tune up your Windows XP system (for free).
- 170 Internet Tips**
Personalize your America Online service.
- 172 Answer Line**
Move everything from an old PC to a new one.



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The Only Windows®-compatible 64-bit PC processor

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Athlon™ 64 3400+
1MB L2 Cache
64-bit Processor
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Athlon™ 64 3200+
1MB L2 Cache
64-bit Processor
Model# ADA3200BOX

\$282.00



Athlon™ 64 3000+
512KB L2 Cache
64-bit Processor
Model# ADA3000BOX

\$223.00



\$404.00

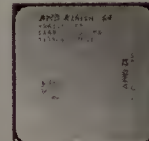
Athlon™ 64 3400+
1MB L2 Cache
64-bit Processor
Model# ADA3400AEP5AP
OEM



\$270.00



Athlon™ 64 3200+
1MB L2 Cache
64-bit Processor
Model# ADA3200AEP5AP
OEM

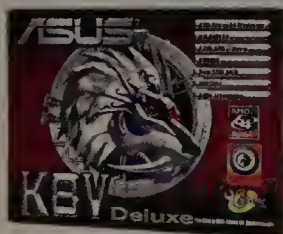


\$211.00



Athlon™ 64 3000+
512KB L2 Cache
64-bit Processor
Model# ADA3000AEP4AP
OEM

Motherboards



\$155.00

ASUS VIA K8T800

Chipset for AMD Socket 754 CPU
Model# K8V Deluxe



MSI VIA K8T800
Chipset for AMD Socket 754 CPU
Model# K8T Neo-FIS2R

\$125.00



Gigabyte nForce3 150
Chipset for AMD Socket 940 CPU
Model# GA-K8NXP-940

\$217.00

Video Cards



\$232.00

ATI Radeon 9800 Pro
128MB DDR 256-bit 8x AGP



\$168.00

eVGA nVidia GeForce FX5700 Ultra
128MB DDRII
Model# 128-A8-N336-AX



\$169.95

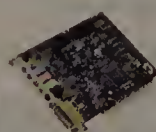
ATI AIW Radeon 9600
128MB DDR 8x AGP w/ Remote
Model# 100-714116

Sound Cards



\$89.00

Creative Labs Sound Blaster Audigy2 ZS PCI Sound Card
Model# SB0350



Creative Labs Sound Blaster Live! 5.1
PCI Sound Card
Model# SB0226

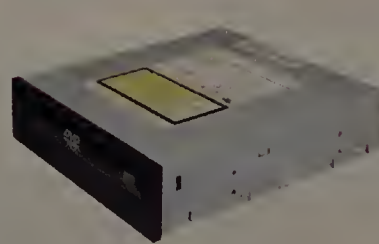
\$30.00



\$16.00

AOpen 5.1 Channel
PCI 2.1 Sound Card
Model# Cobra AW850

CD/DVD ROMs



\$31.00

Sony 16x DVD-ROM Drive
Model# DDU1612/B2
OEM



\$32.50

Lite-On 16x DVD-ROM Drive
Model# XJ-HD166 BLACK
OEM



\$19.00

Samsung 52x CD-ROM Drive
Model# SC-152GEBB
OEM



Shoppers' Choice Award 2003 Best Place To Buy Components

AMD Athlon™ 64 FX Processor



The Only Windows®-compatible 64-bit PC processor

- The first 64-bit PC Processor in a class by itself designed specifically for cinematic computing
- Only AMD 64 technology runs today's 32-bit and tomorrow's 64-bit software
- Full throttle technology for immersive gaming and amazing digital media



Athlon™ 64 FX-53
1MB L2 Cache
64-bit Processor
Model# ADAFX53DEP5AT
OEM

\$785.00



Athlon™ 64 FX-51
1MB L2 Cache
64-bit Processor
Model# ADAFX51BOX

\$745.00



AMD Opteron™ Model 244
1MB L2 Cache
64-bit Processor
Model# OSA244CEP5AL
OEM

\$441.00



AMD Opteron™ Model 244
1MB L2 Cache
64-bit Processor
Model# OSA244BOX

\$461.00



AMD Opteron™ Model 246
1MB L2 Cache
64-bit Processor
Model# OSA246BOX

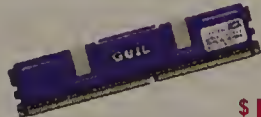
\$689.00

Memory



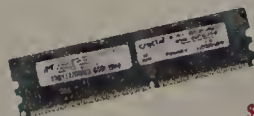
\$106.00

Kingston PC-3200 184
Pin 512MB DDR SDRAM



\$104.00

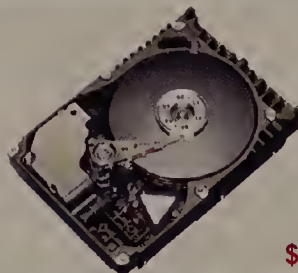
Geil Value Series PC-3200
184 Pin 512MB DDR - OEM



\$58.00

Crucial PC-2700 4T 184
Pin 256MB DDR SDRAM - OEM

Hard Drives



\$73.00

Seagate 80GB 7200RPM
IDE Ultra ATA100 2MB Buffer
Model# ST380011A - OEM



\$72.00

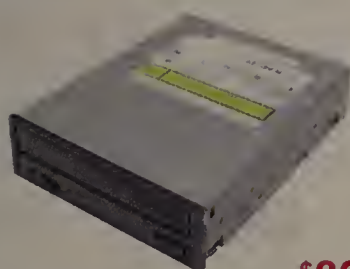
Western Digital 80GB
Special Edition 7200RPM IDE
8MB Buffer WD800JB - OEM



\$59.50

Maxtor 40GB 7200RPM
IDE Ultra ATA133 2MB Buffer
Model# 6E040L0 - OEM

CD/DVD RWs



\$89.00

NEC 8x DVD±RW Drive
Model# ND-2500A - OEM



\$170.00

Plextor 8x DVD±RW
Drive Model# PX-708A/SW-BL



\$37.00

Lite-On 52x32x52
CD-RW Drive ATAPI/E-IDE
Model# LTR-52327S -OEM



\$35.00

Infogames Unreal
Tournament 2004



\$37.00

EA Games Battlefield
Vietnam (Ibox)



\$42.00

Activision
Call of Duty



\$24.00

Sierra Half Life
Platinum Edition 2

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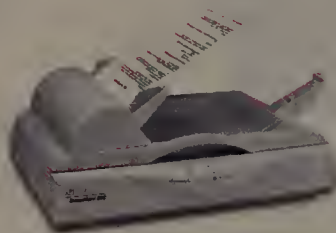


“The DocuMate 252 establishes a new standard in price/performance, image quality and ease-of-use which are three of the most important criteria in selecting a workgroup scanner.”

—Susan Moyse, InfoTrends Research Group

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STAPLES

Protection, Mice, and Digital Video Cameras

HARDWARE FIREWALLS are just the tip of the security iceberg this month, as our two-part "Ultimate PC Protection Guide" also looks at software firewalls, antivirus programs, anti-spyware scanners, and

spam catchers. Elsewhere, some nifty mice and mouse/keyboard combinations bask in the *Top 100* Spotlight, and an array of digital video cameras receive extended scrutiny in our feature article "DV Stars."



77 Router Firewalls

Both Linksys's Wireless-G WRT54G and Microsoft's Wireless-G MN-700 hardware firewalls garnered high marks for security and ease of use.



143 Wireless Keyboard-Mouse Set

Gyrations's Ultra GT Full-Size Keyboard has 15 customizable keyboard buttons, and its space-age mouse supports acrobatic 3D in-air input.



112 Digital Camcorder

The Panasonic PV-DV953 earned the highest rating in our digital video camera roundup, thanks to its outstanding image quality and features.

THIS MONTH'S CROP OF TOP PRODUCTS

DESKTOP PC

- 144 HP Compaq Presario 8000Z
★★★★

NOTEBOOK PC

- 148 Toshiba Satellite A45-S250
★★★★

INKJET PRINTERS

- 72 Canon i80 Color Bubble Jet Printer ★★★★★
151 Canon i455 Desktop Photo Printer ★★★★★

GRAPHICS BOARDS

- 155 Asus Radeon 9800 XT ★★★★★
155 ATI All-In-Wonder 9600 XT ★★★★★
155 BFG Technologies Asylum GeForce FX 5950 Ultra ★★★★★
155 MSI FX5900 XT-VTD128 ★★★★★

DIGITAL CAMERAS

- 157 Leica Digilux 2 ★★★★★
157 Nikon Coolpix 8700 ★★★★★
157 Olympus C-8080 Wide Zoom ★★★★★

REWITABLE DVD DRIVES

- 153 AOpen 8X DVD+/- RW Burner (DRW8800) ★★★★★
153 Lite-On LDW-812S ★★★★★

DIGITAL CAMCORDERS

- 112 Panasonic PV-DV953 ★★★★★
112 Sony DCR-HC20 MiniDV Handycam ★★★★★

WIRELESS KEYBOARDS AND MICE

- 143 Gyrations Ultra GT Full-Size Keyboard Suite ★★★★★
142 Kensington Expert Mouse Wireless ★★★★★
142 Logitech Cordless Click Plus Optical Mouse ★★★★★
143 Logitech DiNovo Media Desktop ★★★★★
143 Microsoft Basic Wireless Optical Desktop ★★★★★

ROUTER FIREWALLS

- 77 Linksys Wireless-G Broadband Router WRT54G ★★★★★
77 Microsoft Wireless-G Base Station MN-700 ★★★★★

VIDEO CONVERTER

- 70 Plector ConvertX PX-M402U
★★★★

FIREWALL SOFTWARE

- 77 Sygate Personal Firewall Pro 5.5 ★★★★★
77 Zone Labs ZoneAlarm Pro 4.5 ★★★★★

ANTIVIRUS SOFTWARE

- 78 Trend Micro PC-cillin Internet Security 2004 ★★★★★

ANTI-SPYWARE SOFTWARE

- 80 Lavasoft Ad-aware 6 Plus ★★★★★
80 Spybot Search & Destroy ★★★★★

ANTISPAM SOFTWARE

- 89 Audiotrieve InBoxer 1.1 ★★★★★
89 CloudMark SpamNet ★★★★★
89 Sunbelt Software IHateSpam 4 for Outlook ★★★★★

DATABASE MANAGEMENT

- 69 FileMaker Pro 7 ★★★★★

THE HIGHEST-RANKING new products reviewed in this issue of *PC World* are listed above, together with the page number where

each product is reviewed and the star rating it received. See find.pcworld.com/10860 for more about *PC World's* Star Ratings.



Time is money. Save both by upgrading to ZT PRO Systems with the Intel® Pentium® 4 Processor with HT Technology.

Need to make the most of your budget?

The Intel® Pentium® 4 Processor with HT Technology can provide immediate performance benefits of up to 25% with existing applications in multitasking environments

Not only can you reduce the burden of supporting older PCs, with the ZT PRO System based on the Intel® Pentium® 4 Processor with HT Technology, you and your PC users will gain another benefit: the ability to run multiple applications simultaneously, enabling employees to complete more tasks in less time. Now you can save your company time and money. Start today.



ZT recommends Microsoft® Windows® XP

ZT PRO ENTERPRISE X6369 \$1,199

Intel® Pentium® 4 Processor with HT Technology 3.20 GHz

Microsoft® Windows® XP Professional Edition
Intel® D865GBFLK (865G Chipset) 800FSB Mainboard
Crucial 512MB PC3200 Dual Channel DDR400 (2 Pieces of 512MB)
Seagate® 120GB Serial ATA/150 7200rpm (8MB Cache) Hard Drive
1.44MB Floppy Drive
Integrated Intel® Extreme Graphic 2 (up to 64MB Share Memory)
52x32x52 CD-RW & 16X DVD Combo Drive
Integrated 6 Channel Enhanced Audio
Integrated Intel® 10/100/1000 Gigabit LAN
U.S. Robotics 56K V.92 Fax Modem
MID Tower Chassis w/450Watt Power Supply & 4 x 1" SATA Hot-Swap Drive Bays
Labtec 2 Pieces Stereo Speaker
Logitech® Internet Keyboard
Logitech® Optical Wheel Mouse
Microsoft® Works 7.0
3 Years Limited Warranty
NEC 19" CRT PureFlat Monitor (Add: \$249.00)
NEC 17" Flat Panel LCD (1280x1024) (Add: \$429.00)



ZT PRO WORKSTATION X6367 \$599

Intel® Pentium® 4 Processor with HT Technology 2.80 GHz

Microsoft® Windows® XP Professional Edition
Support 8X AGP & 800FSB Mainboard
Crucial 256MB PC2700 DDR333
Seagate® 40GB Ultra ATA/100 7200rpm Hard Drive
1.44MB Floppy Drive
Integrated Real 256 bit 2D/3D Graphic (up to 32MB Share Memory)
52x32x52 CD-RW Drive
Integrated 6 Channel Audio
Integrated 10/100 LAN
56K V.92 Fax Modem
Micro-ATX Chassis w/300Watt Power Supply
2 Pieces Stereo Speaker
104 Keys PS2 Keyboard
2 Buttons Ps2 Scroll Mouse
Microsoft® Works 7.0
3 Years Limited Warranty
NEC 19" CRT PureFlat Monitor (Add: \$249.00)
NEC 17" Flat Panel LCD (1280x1024) (Add: \$429.00)



ZT PRO WORKSTATION X6368 \$799

Intel® Pentium® 4 Processor with HT Technology 3 GHz

Microsoft® Windows® XP Professional Edition
Intel® D865GBFLK (865G Chipset) 800FSB Mainboard
Crucial 256MB PC3200 DDR400
Seagate® 80GB Serial ATA/150 7200rpm (8MB Cache) Hard Drive
1.44MB Floppy Drive
Integrated Intel® Extreme Graphic 2 (up to 64MB Share Memory)
52x32x52 CD-RW Drive
16X DVD-ROM
Integrated 6 Channel Enhanced Audio
Integrated Intel® 10/100/1000 Gigabit LAN
U.S. Robotics 56K V.92 Fax Modem
MID Tower Chassis w/350Watt Power Supply
2 Pieces Stereo Speaker
Logitech® Internet Keyboard
Logitech® Optical Wheel Mouse
Microsoft® Works 7.0
3 Years Limited Warranty
NEC 19" CRT PureFlat Monitor (Add: \$249.00)
NEC 17" Flat Panel LCD (1280x1024) (Add: \$429.00)

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Found every day in the center of the PC World home page, our "special features" section bundles related articles on the most important and interesting topics in the world of technology. Subjects covered in this section range from digital security and antivirus efforts to consumer electronics to PC upgrades and beyond. Check it out daily—you'll be richly rewarded by the wealth of news, tips, and resources you find there.



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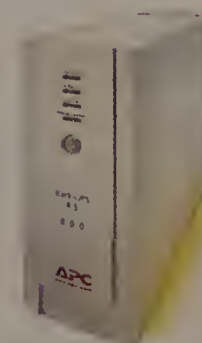
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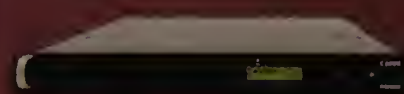
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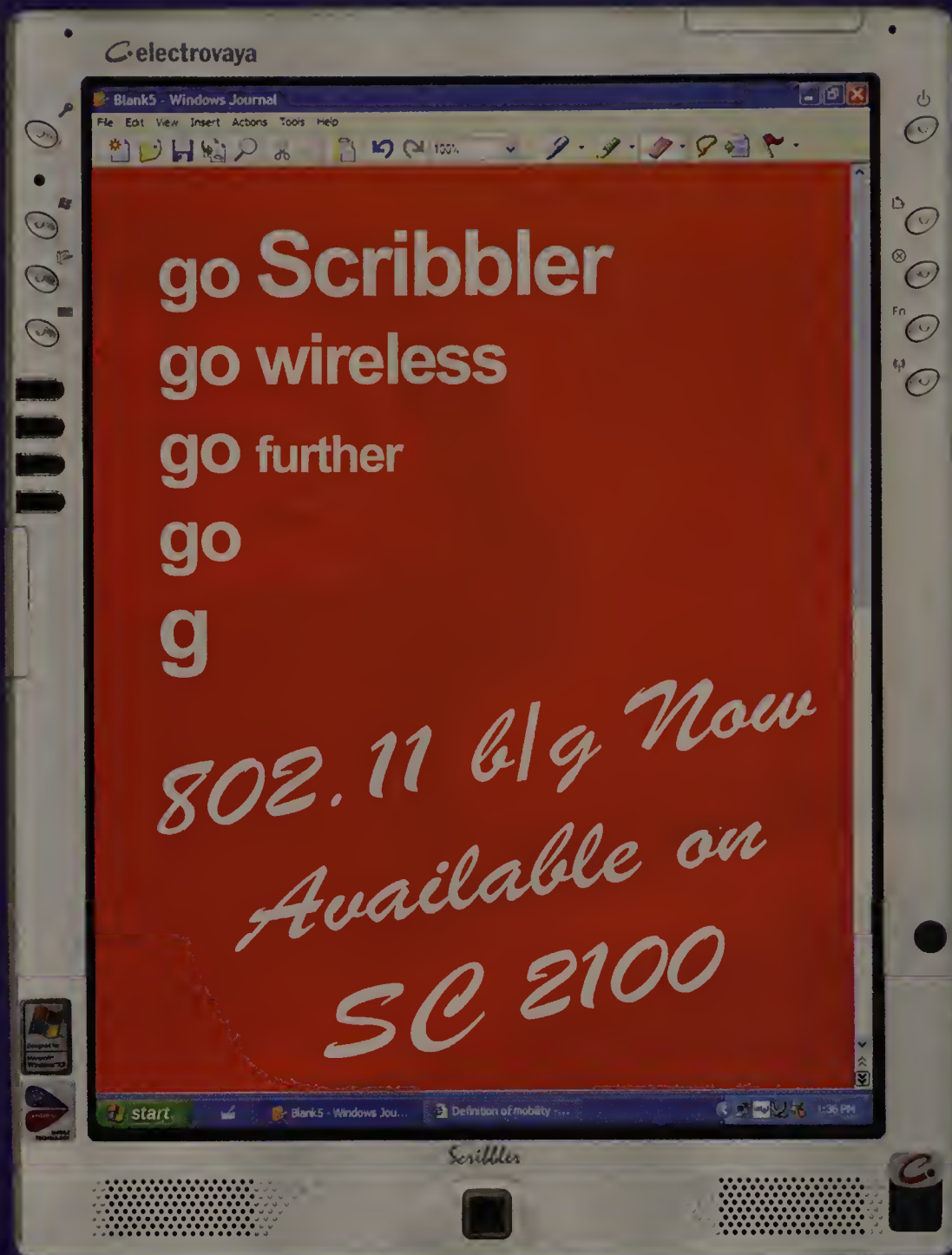


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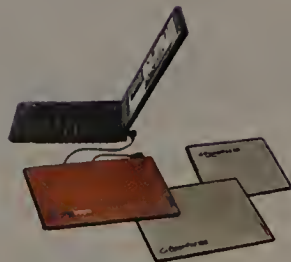
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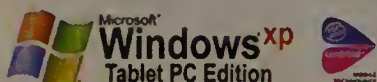
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The More Operating Systems, the Merrier

Why I'm switching to the Macintosh—and back to the PC again—every day.

I'M NOT USED TO HAVING EPIPHANIES in computer stores. But when I dropped into a local merchant recently in search of a new laptop, I took a wrong turn and stumbled upon a row of Apple PowerBooks. Suddenly, I was asking myself an unexpected question: Should I consider a Mac?

Why not? The 12-inch PowerBook G4 offered the sort of trim-yet-feature-rich hardware package I was looking for. And although Mac desktops can be pricey, this portable was temptingly cheap. Then there's Mac OS X 10.3, which is not only a thoroughly modern operating system but one immune from Windows security glitches and the Blue Screen of Death. Before I knew it, I was ordering a PowerBook.

I haven't really succumbed to Apple's "Switch" campaign, though: My Windows desktops still outnumber the Mac notebook two to one. Call me a Switch-Back-and-Forth, but at the moment using both OSs seems utterly natural.

True, some of my Windows-centric coworkers and cohorts have responded to my purchase with an air of befuddled distaste. Then again, most folks who sneer at the bi-platform life haven't tried it. These days, spending time with both a PC and a Mac is a little like owning a Buick and a BMW: For all the machines' disparities, most rules of operation are the same.

For instance, my mousing hand has already trained itself to deftly segue between Windows' taskbar and Mac OS X's Dock. My USB peripherals talk Mac as well as Windows. And file-compatible Mac editions of applications—from Word and Quicken to Adobe Creative Suite and Corel Painter—let me shuttle documents between OSs without a hitch.

So the Mac way is surprisingly compatible with the Windows way. The question



remains: Is it better? In some ways, absolutely. For one thing, it's a more logical world than the hodgepodge known as Windows XP. Compared with XP networking, configuring the PowerBook for multiple LANs was almost...well, *pleasant*.

On balance, the Mac OS is a less irritating platform than Windows, but it's not annoyance-free: While I was writing this column, the first OS X virus hit the scene. And though the Unix-based OS X feels reasonably robust, individual apps have choked on me (including Apple's own Safari browser). Still, there's comfort in

knowing that the vast majority of spyware, virus, and Trojan horse writers design malware exclusively for Windows.

When you buy into Mac software, you get Mac hardware in the deal. And if this PowerBook were a Windows notebook, it would be one of the better ones I've encountered: The system's aluminum case is only 1.18 inches thick, yet it provides a full complement of ports and a slot-loading DVD burner. Even the power adapter—which wraps up into a tidy, compact cube—shows uncommon attention to detail.

The worst thing about the Mac is the best thing about Windows: If something can be done on a computer, there are almost always multiple Windows-compatible products that let you do it. Mac pickings remain slimmer, even though cool tools often show up for it first. (The Windows world is *still* busily cloning Apple products such as iTunes.)

Who knew you could be a Mac snob on a part-time basis? Odds are that the next computer I buy will be another Windows box, but I'm glad I realized that the Mac remains a viable option—even for a mostly Windows guy like me. ■

Contact PC World Editor in Chief Harry McCracken at mageditor@pcworld.com. For more Mac-oriented musings, check out Senior Editor Rebecca Freed's Mac Skeptic online column (find.pcworld.com/42090).

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Point, Click, \$ave

When the closest Post Office is your own PC, neither snow nor rain nor heat nor gloom of night is ever a problem!

Having several packages to mail and in need of postage stamps, Bill Laberis did what a lot of small-business owners do: He drove to the local Post Office™. Forty minutes later, he was back in his Holliston, Massachusetts office. But while standing in line, he noticed a poster touting the many and varied services offered online at www.usps.com.

"Here's the killer," Laberis said. "I found out I could have sat at my PC with a cup of coffee and taken care of my postal chores in less than two minutes. And in doing so, I would have gained the better part of an hour's worth of office productivity. Let's face it, for those of us who run small businesses, time is what we always need."

Laberis is part of a "great awakening" among small-business owners and consumers, who are discovering business-friendly services at usps.com that will turn a desktop into a virtual Post Office. In fact, time-hungry businesspeople and others will make some 265 million visits to the Web site this year—50% more than last year, with similar growth expected over the next few years, according to Bob Krause, manager of new business operations at usps.com.

BROAD RANGE OF TIME-SAVING SERVICES

Krause says the customer response to some of the online services has been "just incredible." Included among the popular services are:

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- **Pick-up services.** Once packages are ready for shipping, the Web site gives users a range of options for having those packages picked up for delivery. These options include **Carrier Pickup**—free regardless of the number of packages. And **Pickup On Demand** is available for a flat fee for any number of packages, up to a total of 70 pounds.

- **Tracking and Confirmation Services.** Make fast work of tracking shipments—simply enter a tracking number on the usps.com home page. (Just click and track!)
- **Buying stamps and other items.** Order sheets or rolls online and have them carrier-delivered promptly. The online Postal Store also features shipping materials, scales, and many other time-saving, money-saving items.

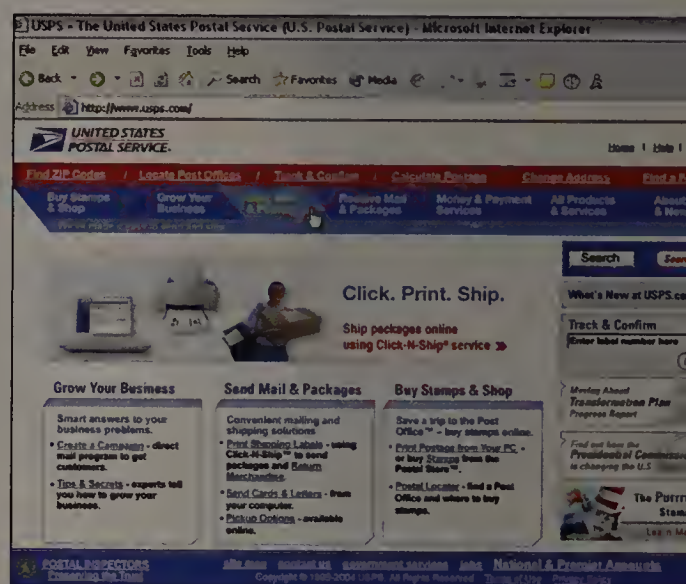
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hold for any reason, request redelivery of packages that couldn't be delivered previously, or notify the Post Office of an address change.

Other services are designed to help small businesses compete more effectively with the bigger guys. By clicking on **Create a Campaign** on the home page, users can access a range of services allowing them to quickly and easily create a Direct Mail campaign—again without ever leaving their offices. The **Tips & Secrets** button takes users to a resources area where experts offer relevant and immediately useful advice on saving money and growing a small business.

"We tried to focus our online offerings on core business needs, and we organized the site around some of the most common tasks," notes Jane Langdon, manager at usps.com. "The steady and rapid growth in traffic to the site, and the number of awards the site has won, seem to say we've hit on a very useful set of online services."

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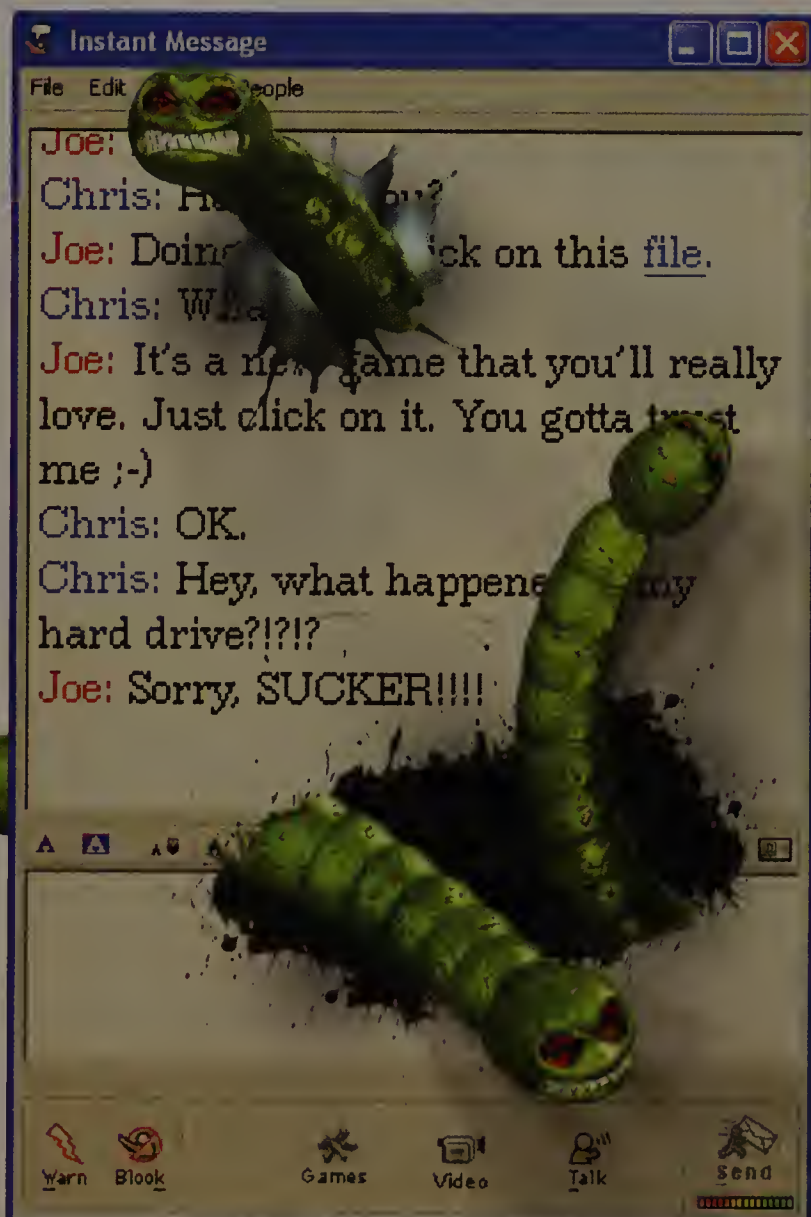
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VIRUSES TARGET IM

VIRUS WRITERS AND SCAMMERS ARE NOW PLYING THEIR TRADE VIA INSTANT MESSAGING. WE IDENTIFY THE REAL THREATS AND OFFER TIPS ON AVOIDING THEM. **BY LIANE CASSAVOY**



WHEN IT COMES TO viruses and worms, e-mail gets all the attention—but now that instant messaging has infiltrated both home and office, it too has become an attractive and easy target for virus writers.

From 2002 to 2003, worms and viruses that spread via IM and peer-to-peer networks increased 400 percent, according to Symantec's Internet Security Threat Report. Already this year, we've seen the Jitux.A and Bizex worms targeting MSN Messenger and ICQ, respectively.

Jitux.A spread itself by tapping users' IM contacts, but Bizex had more malicious intent: It sent you a link to a Web site that scanned your PC for data on your electronic payments and finances. The site was quickly shut down once the worm was discovered, but no one is sure how much data was collected before then.

Expect the threats to continue. As users get more adept at stopping traditional attacks, virus writers will look for softer targets, says Bill Adler, president of CyberScrub, a PC security software vendor. "Instant messaging, for many reasons, is a softer target."

But don't scrap your IM client just yet. Because most IM viruses and worms can't propagate automatically—they require you to click a link or download an applet—you can avoid many of the threats if you practice safe computing. See "Chat Protection" on the next page for tips on keeping yourself and your data safe.

NO BUDDY OF MINE

STEVE SANDERS, a student at the University of California at Berkeley, learned this safety lesson the hard way. He was reading a buddy's profile on AOL Instant Messenger when he saw a message that read,

"I can't believe I found [Sanders's screen name] picture here. HAHAHA," with a hyperlink to take him to a site where he could view the photos. Sanders clicked the link and agreed to download the "necessary" applet to view the photos.

"I'm usually more careful than that," Sanders says, but the site "looked legitimate, and...it was directed right at me, so I installed the software."

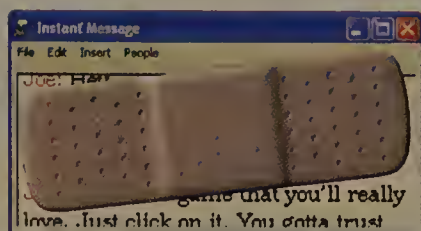
The site had no photos of Sanders; instead it held the Buddypicture.net Trojan horse, which would have installed adware and spyware onto his PC and distributed itself by placing its link in his AIM profile. Luckily, his antivirus software caught it.

Another prime example is the Osama Found game, which circulated rapidly via AIM earlier this year. It spread by sending a link to AIM users, inviting them to download a game in which they could pretend to catch bin Laden. Users who clicked got the game—as well as BuddyLinks, a program that grabbed all of the user's IM contacts and sent them the same message.

LIMITS TO THREATS

THE VERY nature of instant messaging—its informality and immediacy—worsens the danger from worms, viruses, and other malware. "People tend to let their guard down when it comes to instant messaging, while we have more a healthy skepticism when it comes to e-mail," explains Bryson Gordon, a senior man-

CHAT PROTECTION



TO PREVENT infection, keep your IM client updated and follow these tips:

- Be wary of files sent via IM, especially those with .exe and .scr extensions, or ones purporting to be games. For best protection, verify with senders before opening.
 - Never click an unsolicited link fed via IM, or one lurking in another member's profile or away message.
 - Check your antivirus company's home page or a general virus site, such as About.com's antivirus.about.com, for news on current threats.
 - Evaluate your protection at Eicar.org, which has an antivirus test.
 - Upgrade employees' IM clients. Lotus offers its own secure IM program; AOL, Microsoft, and Yahoo all have paid corporate IM services with built-in security. Products from FaceTime and Akonix help secure existing consumer IM apps and let you filter messages by content.
- See this month's *Privacy Watch* (page 46) for help with IM spam, too.

ager with McAfee Security's Consumer Division.

However, the most popular IM clients—such as AIM and Yahoo Messenger—work through closed networks, meaning that users can communicate only with others on the same service (unless you are one of the few who employ third-party clients, such as Trillian, that let you exchange messages with others on multiple networks). That lack of interoperability may be annoying, but it also helps to curtail the spread of viruses and

makes IM a less appealing target than e-mail.

And unlike Internet Explorer or Windows, IM apps—at least so far—have fewer published holes through which viruses and worms can spread without a victim's aid.

SOFTWARE HELP

ANTIVIRUS AND security software vendors have extended protection coverage to IM. For example, Zone Labs, maker of the popular ZoneAlarm firewall, last year released IMSecure, a \$20 program that encrypts messages and blocks potentially hazardous URLs.

Symantec's Norton Antivirus includes instant message scanning, and McAfee added the same feature to its August release of VirusScan 8. Both of these programs promise to remove viruses from files received via IM, and to protect against viruses that may be downloaded through URLs or links received in messages.

And here's some more good news: In informal PC World tests of several antivirus and security applications—with or without special IM components—all caught known viruses sent via AIM.

No antivirus program or firewall—both considered must-haves for every PC user—can prevent all virus attacks. Your vigilance remains your best defense. Says Oliver Friedrichs, a senior manager at Symantec Security Response, "The primary reason why these threats are successful is that people continue to trust content that they receive."

IN BRIEF

Tidbyte



OPTICAL DISC DELUGE: In an apparent effort to further befuddle a populace already dizzy with next-generation optical-disc options, Taiwanese researchers recently introduced yet another: Forward Versatile Disc (FVD). Other high-capacity formats such as Blu-ray and HD-DVD rely on pricey blue lasers, but FVD drives will use today's less-expensive red lasers to create discs capable of storing 9.8GB (dual layer) on a single side. In contrast, current standard DVD discs hold about 4.7GB.

Product Pipeline



POCKET MEMORY: If the infinitely handy USB key has become the Swiss Army knife of computing, what do you call an actual Swiss Army knife with flash memory? Simple: Call it the SwissMemory USB knife, and put it on every techie's wish list. Victorinox's \$69 product includes a blade, a red LED light, a nail file with screwdriver, scissors, a pen, and 64MB of flash storage.

STORAGE

IT'S REALLY BIG: NEW 400GB DRIVE

SPEEDY NEW HITACHI DESKTOP HARD DRIVE NEARS HALF-TERABYTE TERRITORY.

HITACHI'S DESKSTAR 7K400 (\$400) is the new king of big: The 7200-rpm Serial ATA hard drive comes with an 8MB buffer and a staggering 400GB of storage. The reasonably priced drive, available now, also features improved digital-media handling capabilities. In our tests it performed exceptionally well on standard desktop applications, too.

To reach 400GB in the new model (find.pcworld.com/41952), Hitachi essentially slipped two more 80GB platters into its 250GB Deskstar 7K250—the fastest hard drive we have tested to date (see January's *Top 10 Hard Drives*,

find.pcworld.com/41950). Adding the extra platters didn't affect performance: The 7K400 completed our tests in 34 minutes, 1 second—21 seconds slower than the 7K250, a statistical tie. And in both our Windows and our applications-based tests, it outperformed the average score of all seven 200GB or larger hard drives we've seen, often by 9 to 16 percent.

The drive is not only speedy; Hitachi says it also excels at streaming video—a key function of set-top, TiVo-like boxes and of PCs used as digital video recorders—thanks to its



HITACHI'S 400GB Deskstar 7K400.

new Streaming Command Set. When used with compatible software, the industry-standard technology alters the drive's error-correcting functions during video streaming to permit minor errors rather

than stopping the stream for correction. Although such errors are unacceptable in PC data, this results in smoother video, with rare, blink-and-you-miss-it imperfections. Hitachi says users should be able to turn this feature on and off. (*PC World* was not able to test it.)

Better streaming abilities aside, this is one fast drive. And at \$400, it's a fairly economical way to prepare a new or existing media-savvy PC for high-definition content, where each hour of video can require 8GB or more.

—Tom Mainelli

PROCESSORS

INTEL PLAYS NAME GAME

CPU NAMES TO CHANGE AS CLOCK SPEEDS LOSE THEIR RELEVANCE.

SOON, BUYING Intel's top processor may not mean buying its fastest. After years of promoting higher clock speeds as a quick way for users to assess performance, the chip giant will drop megahertz as part of its CPU names, instead using car-style "series" names. Chips will be classed in a series based on key features that affect performance, including clock speed.

Desktop Celeron chips will carry the 300 series name, Pentium 4s will make up the 500 series, and P4 Extreme Editions will be the 700 series. CPUs debuting midyear will



carry the new monikers; with rare exceptions, Intel won't rename existing CPUs.

Within each series, Intel will assign a specific number based on features such as architecture, cache size, front-side bus speed, and gigahertz, as well as relevant new technologies. In the new scheme,

a 3.4-GHz P4 with a 512KB L2 cache and an 800-MHz frontside bus might be called a P4 540, while the same chip with a 1MB L2 cache might be a P4 550.

Intel clearly hopes the new series will lessen confusion about its Pentium M laptop chips—part of the Centrino platform—which often outperform Mobile P4s with faster clock speeds. Accordingly, Pentium Ms, which top out at 1.7 GHz, will be the 700 series, while Mobile P4s, which run at up to 3.2 GHz, will be the 500 series. Mobile Celerons will be the 300 series.

In 2001 AMD faced a prob-

lem with its Athlon XP chips similar to what Intel has now with Pentium M: The AMD chips had lower clock speeds than Intel's top chips, but often outran them in benchmarks. AMD then shifted its naming method to one based on equivalent performance ratings, hoping to help buyers make more-informed purchases. Intel executives have the same expectation now.

One drawback to the new system, says Mercury Research analyst Dean McCarron, is that while differentiating among Intel's chips will be easier, the names will not help much when shoppers compare them with AMD's offerings. That means savvy buyers will depend even more upon test results and reviews to get the full scoop, he says.

—Tom Mainelli



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Desktop Support
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PREVIEW

NEW CELLS: COOL, CAPABLE

LATEST CROP OFFERS BETTER CAMERAS AND FASTER NET SPEEDS.

IF YOU ARE STILL using your cell phone merely for talking these days, you're behind the times. The latest models feature increasingly sophisticated integrated cameras, the fastest data speeds yet for Internet

generation wireless network) phones. Due out this fall, the LG8000 will support 1X EVDO (Evolution Data Only) speeds, which ran from 180 to 300 kilobits per second in tests of Verizon's EVDO network (see find.pcworld.com/42132), a significant improvement over the typical 10 to 50 kbps offered on today's 2.5G networks. This phone also comes with a 1.3-megapixel camera, a flash, and a 10X digital zoom, and it can record MPEG-4 video clips of up to 15 seconds.

According to the phone manufacturers, you will need these 3G speeds for the new generation of data applications, which include video messaging, music downloads, and gaming. Another new cell phone that is designed to accommodate the growing number of games for



SIEMENS'S CX66 has a tiny joystick that is intended to make playing games easier.

these devices is the CX66 by Siemens. In place of the navigational button seen on most cellular phones, the CX66 offers a tiny joystick.

Nokia and Sony Ericsson are introducing innovative new phones of their own, as well. Nokia's stylish 7610 comes with a swirly, asymmetric keypad and a 64MB Multi-MediaCard for storing the images captured by its 1-megapixel camera. Sony Ericsson's S700i camera phone, fittingly, borrows its design from Sony's Cyber-shot line of digital cameras.

Handset manufacturers say cellular carriers will be launching these new models by next fall. Expect to pay premium prices for these new handsets—the usual surcharge for sporting the latest and greatest in mobile technology.

—Yardena Arar



KYOCERA'S KOI features a display that swivels and 16MB of memory to hold your photos.

access, and gaming capabilities—and they're all packaged in innovative designs.

Kyocera's Koi, for example, has a built-in 1.2-megapixel camera, a tiny flash, and a 5X digital zoom; you can use it to capture still images or 15-second MPEG-4 video clips. When open, the Koi resembles a clamshell, but the roomy 2-inch display swivels closed rather than clapping shut. The unit's 16MB of on-board memory lets you store up to 40 images at the highest-resolution setting.

LG Electronics, meanwhile, is launching one of the first true 3G (third-



THE LG8000 IS one of the first phones to support DSL-like data speeds.

IN BRIEF

Tidbytes



YOU HAD ME AT \$1.6 BILLION: After years of bitter legal wrangling and snide public comments about monopolistic tendencies, Sun Microsystems Chief Executive Officer Scott McNealy recently made up with Microsoft CEO Steve Ballmer. McNealy went on to predict a future filled with cooperation, software compatibility, and mutual profitability. Smoothing the two companies' transition to best buddies were two Microsoft payments to Sun: one for \$700 million to settle all pending antitrust issues and one for \$900 million to settle all pending patent issues.

I SPY A LAWSUIT: Software vendors who spy on unsuspecting Utah residents could pay a steep price. Starting in May, any company that installs spyware onto a Utah user's computer without permission faces a \$10,000 liability under the state's Spyware Control Act. While privacy advocates decry spyware, the same groups also believe a single federal law would be more effective than individual state laws. You just can't please some people.... Meanwhile, legislators in California and Iowa are also considering anti-spyware laws.



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The EX-Z40. It's incredibly small, with 4 mega-pixels, a gigantic 2" LCD screen, and 3X optical zoom. But now that it comes with a battery that lasts 2.5 times longer than average,* you may have to make more friends.

EXILIM
ZOOM



CASIO
exilim.casio.com

*2.5 times the battery life of current Casio cameras (comparison between EX-Z4U and EX-Z40).
*CIPA standard for battery life indicates 360 photos on a single charge. Image on camera LCD simulated.

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UTILITIES

TOOLS TO FIND PC DATA FASTER

FORGET WINDOWS' SEARCH: NEW TOOLS CAN FIND KEYWORDS ON PCs IN SECONDS.

TODAY'S MASSIVE hard drives are great for pack rats who never toss anything. But how do you find your data when you have 400 gigabytes' worth of places to look?

Solution: Several applications now promise to rapidly search your PC for the file, e-mail message, or attachment that you need.

X1 Technologies' \$99 X1 Search (www.x1.com) and DTSearch's \$199 DTSearch Desktop (www.dtsearch.com) both index your entire hard drive, and then let you essentially Google its contents. Stata Labs' more limited and, at \$60, less expensive Bloomba (www.statalabs.com) is a stand-alone e-mail client that indexes messages and attachments so you can search them far more quickly than in other e-mail software like Outlook or Outlook Express.

RUN IT AS YOU SLEEP

WITH X1 OR DTSEARCH, creating the initial index of your PC's contents can be time-consuming; a McMansion hard drive will take overnight. Either program will index most popular file formats, along with Outlook and Outlook Express messages. X1 also supports Eudora and Netscape mail, and will index Outlook and Eudora attachments and Outlook contacts.

Once the index is complete, however, searches become vir-



tually instantaneous. By the time you've finished typing a search term in X1, the list of results is already done.

The biggest difference between X1 and DTSearch is in their search options. X1 is designed to be simple. If you enter two search terms, the program will, by default, look for files that contain both terms. But you can have it flag files with one term and not the other, and you can specify where it should look—in the file name, for instance.

DTSearch is more sophisticated: It lets you use Boolean operators like *and*, *or*, and *not*. It can seek out words that sound like the one you want, or find misspelled versions of the search word.

Click on a result, and both X1 and DTSearch will show its contents in a file viewer window that's part of the interface. X1's previews tend to be closer to the real thing—for instance, its previews of spreadsheets include the lines

separating cells, while previews in DTSearch do not.

Both of the programs let you launch a file in your results with just a click or two. Both also allow you to reply to, forward, print, or move an e-mail message without launching the full version of Outlook.

MAIL CALL

BUT IF YOUR MAIN concern is searching e-mail, consider Bloomba. It lets you search for a word anywhere in a message or attachment, or narrow down a search based on the sender, the recipients, or the subject. You can save a search so that with one click you can find, say, any message having to do with Linux.

These programs won't end all your data-location troubles: Even on my puny 30GB hard drive, a search for *Longhorn* and *search* yielded 18 hits I had to sort through. But these new tools are certainly far superior to Windows' pathetically slow Search utility, and X1's simple interface and reasonable price make it an especially appealing choice.

—Edward N. Albro

Bloomba

Stata Labs

Street: \$60

★★★★☆

find.pcworld.com/35591

DTSearch Desktop

DTSearch

Street: \$199

★★★★☆

find.pcworld.com/41988

X1

X1 Technologies

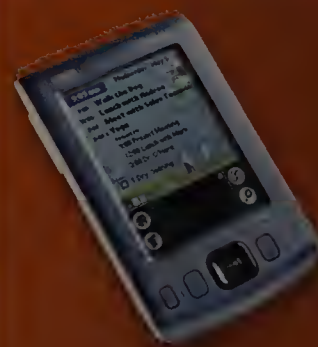
Street: \$99

★★★★☆

find.pcworld.com/41984

IN BRIEF

Product Pipeline



ZIRES AIM HIGHER: Waiting for a multimedia-friendly PDA that won't bust your budget? PalmOne's Zire 31 (above) delivers a color screen, an MP3 player, 16MB of memory, and an SD card slot for \$149, a new low price for a color Palm. Also new is the \$299 Zire 72, successor to the Zire 71. It has a built-in 1.2-megapixel camera capable of capturing video as well as still photos. Other extras: Bluetooth, 32MB of memory, and DataViz software for creating and editing Office-compatible files.



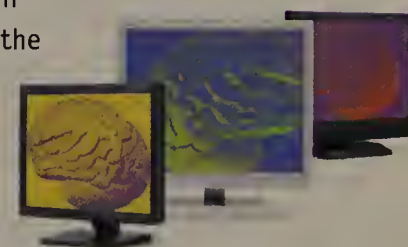
PERSONAL POSTAGE: If you're bored with plain old stamps for your snail mail, check out Avery's Web-based Creative Postage Labels (go to find.pcworld.com/41956). At the Avery site, you can place any digital image next to that of a standard first-class mail stamp on stick-on labels sold in sheets of 20 for \$20 (plus \$3 shipping and handling). That's about \$1.15 per label, a 78-cent premium for the privilege of seeing your company's logo (or your loved one) on genuine U.S. postage.



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image quality degradation
on long cable runs

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improve ergonomics
Ultra-thin frames, easy pivot
and height-adjustable stands
adapt to your users' styles

Clamp down on energy costs
Power-off timer automati-
cally shuts monitor down
after a user-determined
amount of time

MOBILE

LAPTOP CPU FOR THE LONG HAUL?

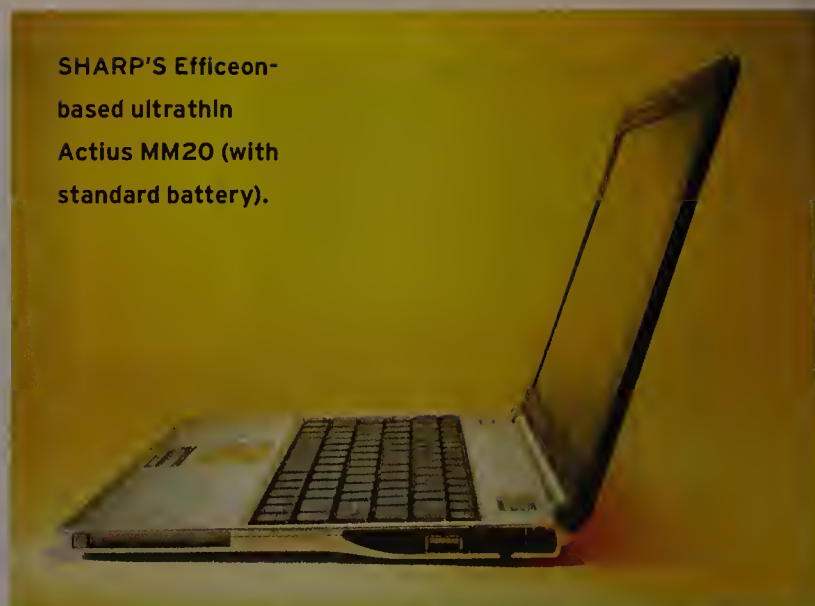
TRANSMETA'S NEW CHIP BOOSTS POWER.

TRANSMETA'S FIRST notebook CPU, the Crusoe, suffered from a double whammy: It delivered dismal performance and unexceptional battery life. Efficeon, Crusoe's successor, does a significantly better job on both counts.

We tested the first notebook in the United States to use the 1-GHz Efficeon TM8600 chip: the \$1499, 2-pound Sharp Actius MM20. In line with Transmeta's predictions, the MM20 performed about 50 percent better in our tests than did its predecessor, the Actius MM10 with a 1-GHz Crusoe TM5800 (find.pcworld.com/41966). The MM20's score of

76 on PC WorldBench 4 is still significantly below the scores earned by similar Intel-based ultralight laptops, such as IBM's ultra-low-voltage 1-GHz Pentium M-based ThinkPad X40, which had a 104 mark on our PC WorldBench 4 tests (find.pcworld.com/41964). But the MM20 did provide smooth video and audio playback when we watched a movie via the external DVD/CD-RW drive (\$99); it even let us work in the background, although that slowed the video.

The MM20's battery life, in our tests with the \$199 extended battery (which brings the weight of the notebook to 2.6



pounds), was an impressive 7 hours, 35 minutes. But the standard battery lasted only 2 hours, 28 minutes—14 minutes less than the MM10's.

The Efficeon improves on Crusoe's performance via a larger 1GB L2 cache, built-in support for DDR400 memory and AGP 4X (Crusoe lacks AGP altogether), and AMD's fast HyperTransport bus technology with throughput up to 1.6GB per second. The new chip also boasts more efficient

code-morphing software, which translates standard x86 instructions into ones the chip understands. Later this year Transmeta will launch Long-Run2, which should improve battery life even further.

The Efficeon can't yet match Intel's best performers, but die-hard travelers in search of the smallest package and the best battery life for business apps should look at Efficeon-based laptops such as Sharp's.

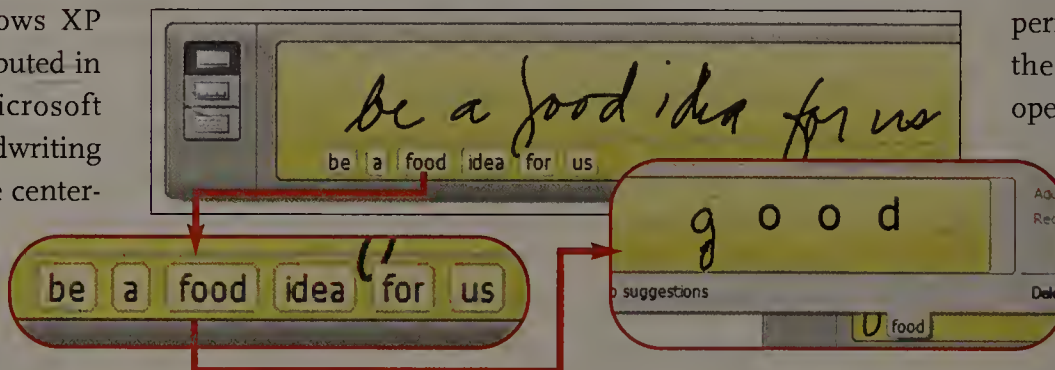
—Anush Yeghazarian

OPERATING SYSTEM

PROMISING UPGRADE FOR TABLETS

IMPROVEMENT TO TEXT INPUT PANEL SIMPLIFIES HANDWRITTEN ENTRIES AND CORRECTIONS.

EVER SINCE Windows XP Tablet PC Edition debuted in November 2002, Microsoft has insisted that handwriting recognition is not the centerpiece of the operating system's pen-based features. But tweaks to improve the handwriting recognition are the most visible changes in Windows XP Tablet PC Edition 2005 (code-named Lonestar)—the first major revision of the operating system. Overall, it seems to be a good revision, especially as a free upgrade for



HANDWRITING recognition happens on the fly in the Text Input Panel (top and left). You can click on incorrect words to change them (right).

current Tablet PC owners.

We tested a Lonestar beta running on a Toshiba Portégé M200 Tablet PC and found the Text Input Panel's im-

provements notable. For example, in some applications the TIP will pop up near the place where you want to enter text, instead of being docked

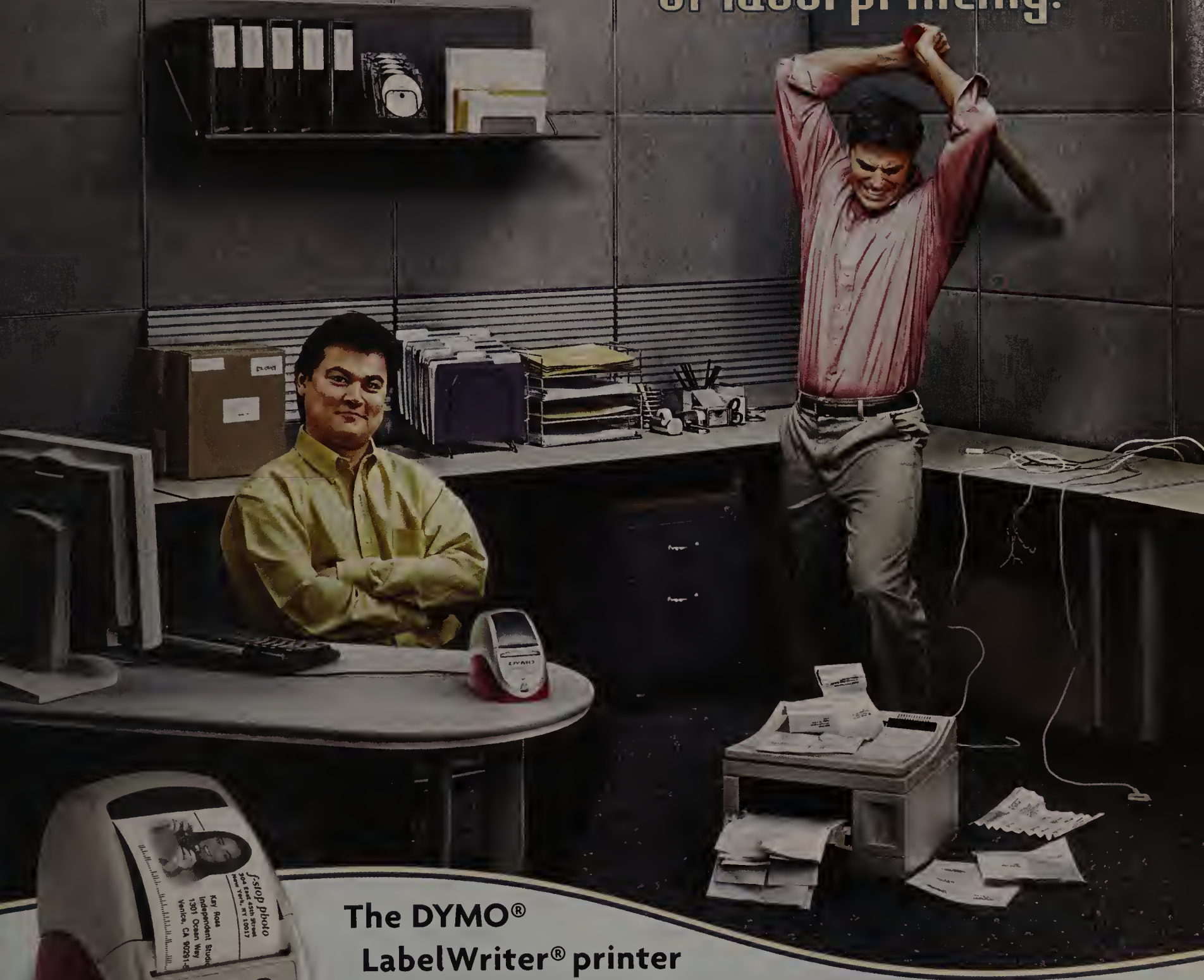
permanently at the bottom of the screen as in the original operating system. It also permits on-the-fly corrections, which makes converting handwriting to text less frustrating than in the original OS.

The new OS will incorporate Windows XP Service Pack 2—Microsoft's major security upgrade (see find.pcworld.com/41996)—and will be released simultaneously with SP2, which is slated to appear this summer.

—Yardena Arar

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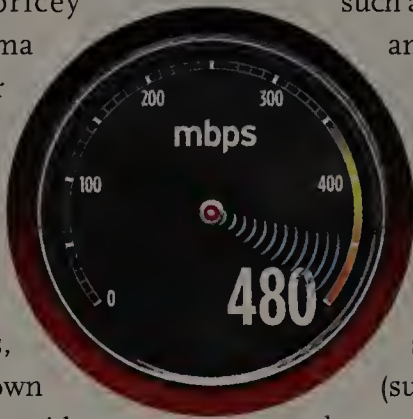
STAPLES

FUTURE TECH

ULTRAFAST WIRELESS

NEW WIRELESS TECHNOLOGY PROMISES UP TO 480 mbps—BUT ONLY AT CLOSE RANGE.

IF YOU'RE tired of cable clutter behind your PC—or behind that pricey giant-size plasma TV—feast your eyes upon Ultra Wide Band. The next generation of high-speed wireless, UWB (also known as 802.15.3a) provides blistering transfer rates of up to 480 megabits per second. Wi-Fi aficionados have nothing to worry about: UWB's highest rate works only within 3 feet. At 30 feet, throughput drops to about 110 mbps. Nevertheless, UWB could become



a building block of several new, limited-range standards such as Wireless USB and the next generation of Bluetooth. Even though UWB is currently embroiled in an industry standards battle (surprise), backers hope to solve all legal and technical issues by year-end. That would clear the way for early products such as set-top boxes that send signals to UWB-equipped TVs, and digital cameras that transmit images wirelessly and quickly.

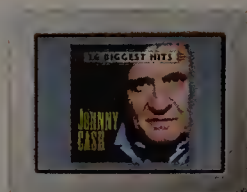
—Tom Mainelli

PRICE CHECK

WAL-MART DOES MP3s

WAL-MART RECENTLY launched its own online music download service at www.walmart.com. Buying from the discount king may not offer the cool cachet of using Apple's superslick iTunes store, but the lower prices—per song as well as per album—can add up over time. To compare, we tallied up the cost of buying the songs and albums of Johnny Cash, our favorite man in black.

Note: The Walmart.com and iTunes stores offer different usage agreements, and the music you download from Walmart—which is in the WMA format—will not work on Apple's iPod. For details, read each site's fine print before you buy.



Start small, with one full album: *Johnny Cash—16 Biggest Hits*.

Walmart.com: **\$9.44**

iTunes: **\$13.99**



Like what you hear? Pick up 12 full albums plus a box set.

Walmart.com: **\$151.64**

iTunes: **\$178.75**

*Prices as of 4/19/04

THREE MINUTES

Will We Get a Do-Not-Spam List?



FEDERAL TRADE COMMISSIONER Orson Swindle, 67, chats about his agency's popular Do-Not-Call list and the proposed Do-Not-Spam list. A former Marine aviator, Swindle spent more than six years in a North Vietnamese prisoner-of-war camp.

Isn't the FTC's Do-Not-Call telemarketing list one of the most popular citizen-participation programs ever?

Certainly since I've been here. It's made real heroes out of us. We see people with T-shirts on, saying, "I like Do-Not-Call." In fact, one of our employees jogging one day had an FTC T-shirt on, and somebody stopped and said, "Thank you for Do-Not-Call."

And now the FTC is considering a Do-Not-Spam registry?

A part of [the federal CAN-SPAM Act of 2003] directs the FTC to take a very serious look at the possibility of a Do-Not-Spam list similar to the Do-Not-Call list. We are in the process of going through that right now. We expect to hear from an awful lot of people, and probably some spammers, too. We have a big task before us...to come up with a report to Congress by mid-June as to what might be done and whether or not it's feasible.

It strikes me that this would be much more difficult than the Do-Not-Call list.

In the world of spam, many people have many e-mail addresses. There are no state or border boundaries. There's an infinite number of e-mail addresses, and there is no regulation. I cannot personally conceive of a way to regulate the Internet in the sense that telephone companies were regulated for a long period of time, and I don't know that that would be desirable.

Is there a specific technology you've seen in your FTC tenure that either really excited or truly terrified you?

I've been through enough in life to not be terrified about too many things. I'm fascinated by the possibilities of the peer-to-peer technology used in transferring files from one person to another. The potential there for productivity efficiencies in other uses, that's just incredible.

Check out the FTC's tips for keeping business computer systems secure at find.pcworld.com/41894.

—Anne B. McDonald ■

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POPULARITY =
INSECURITY?SCAN QUALITY:
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RESOURCESREADERS DECRY OFFSHORE
TECH SUPPORT

THOUGH YOUR ARTICLE "When Help Is Half a World Away" [Consumer Watch, April] helps focus attention on a growing problem, it does not address the most obvious solution: Stop buying merchandise from companies that do not provide adequate or understandable support!

Steve Savage, via the Internet

COLUMNIST Anne Kandra suggests that if you have difficulty communicating with support personnel who have accents, you can "hang up and try your luck with a dif-

LETTER OF THE MONTH

How to Fight Spam—and Viruses

THE INFORMATION in "Tech Weapons of Spam Destruction" [News and Trends, April, page 26] may have been the most interesting thing in the magazine. Working in the on-site tech support field, I see a lot of viruses come through. The biggest thing new viruses seem to have in common is a masked e-mail address. If Yahoo and AOL are indeed working on technology to block spam bearing faked addresses, then someone should notify the anti-

ferent rep." Not bad advice—unless, like me, you just spent over an hour waiting to talk to someone in the first place.

Matt Metz, Scottsdale, Arizona

I JUST terminated my longstanding relationship with EarthLink because it recently shipped more than a thousand jobs to India. I may pay more for my new services, but I don't want to pay for the loss of my colleagues' and fellow citizens' jobs.

I strongly urge everyone to call support and help-line numbers *before* buying products or services. If an offshore company answers the phone, shop elsewhere.

Doug Nadel, Apex, North Carolina

POP-UPS: NOT MUSIC AT ALL

CHRIS VANDERHOOK of SpecificMedia is more than wrong in his statement that blocking pop-ups is almost like ripping off music online ["Bye-Bye, Pop-Ups. Hello...?" News and Trends, April].

Your interviewer should have asked him, "Mr. Vanderhook, it seems you're saying that if we can't block pop-ups, we shouldn't ignore them either, correct? Wouldn't that be the same as saying that

when we watch TV we shouldn't turn the channel when a commercial comes on, or even get up to go to the kitchen? How about radio: Should we have to listen to the ads? We can't change the station?"

Jonathan Cobb, Chattanooga

PC SECURITY

IN APRIL'S "Lock Down Your PC," Whitfield Diffie, the chief security officer of Sun Microsystems, is quoted as saying: "To protect yourself fully...replace Windows with a Unix-like operating system, like Linux, Mac OS, or Solaris."

This is fine for a technically inclined PC user, and for organizations with large bank accounts to hire professional staff for support and deployment. But for average users, that choice will not come about until Windows' competitors become ubiquitous and very user friendly.

At the same time, I bet that the more Linux and other operating systems grow in complexity and status, the more compromised their security will be.

Alma Caceres, Hyattsville, Maryland

PASSWORD TRICK

MARCH'S Privacy Watch describes ways to remember strong passwords. An even better strategy: Use common words separated by numbers. For a football team I created this password: *foot123ball*. The password was easy to change and remember, and it was not in a word list.

Tom Vardon, via the Internet

CHEAPSKATE PRINTING

"THE CHEAPSKATE's Guide to Printing" [April] omitted the most obvious way to save on color ink: Print in gray scale. Besides gray scale, my printer's default settings also include 'print on both sides' and 'draft mode'.

Dave Moroder, via the Internet ►

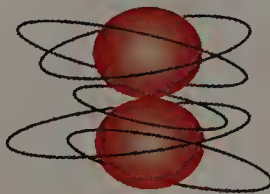


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LETTERS

EYE OF THE BEHOLDER

IN YOUR April article on scanners ["Put Your Film Into Your PC," *Top 100 Spotlight*], page 140 shows your test results. I definitely prefer the Minolta DiMage 5400 printout on the right, which you describe as "Worst," over the other two.

Richard Cole, Des Moines

Editor's response: Image quality is indeed a subjective judgment. We use a jury of four people to assign image-quality scores, so the results are the consensus of that jury's opinions. Also, to come as close as we can to judging the scanners' own capabilities, we do not make modifications with an image editor.

—Rebecca Freed

DON'T FORGET THE LIBRARY

ONE OF THE biggest search secrets that "Beyond Google" [April] omitted is to use a library card to access—via the Internet—electronic books, magazine and newspaper databases, online health resources, and business information. Many libraries have created Web sites that allow cardholders remote access to resources that were once available only in print.

A. Paula Wilson, librarian and author of Library Web Sites: Creating Online Collections and Services, Phoenix

PC World welcomes letters to the editor. We reserve the right to edit for length and clarity. Send e-mail to letters@pcworld.com. ■

CORRECTIONS

MAY'S "PC Problems? Fix 'Em Yourself" should have said that nickel metal hydride batteries do not require deep discharges to avoid shortened life.

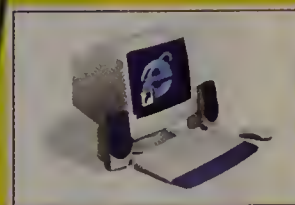
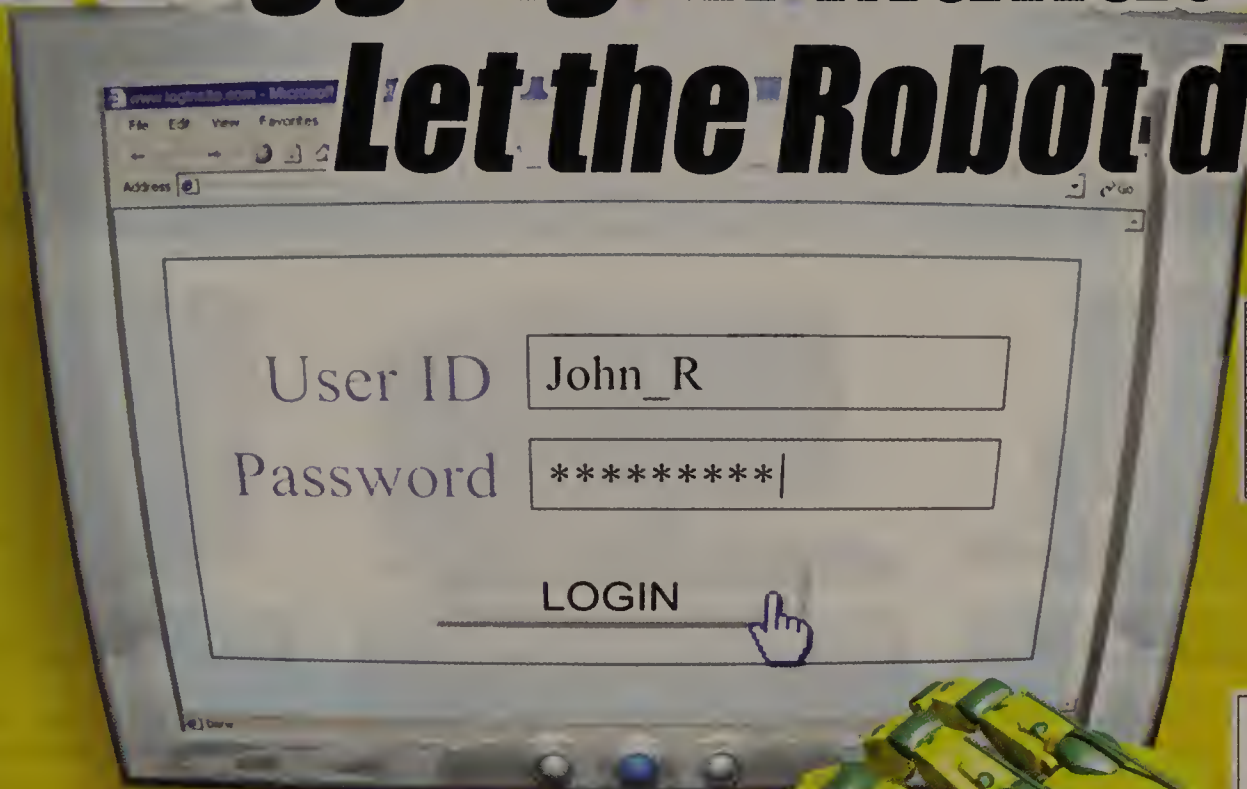
In May's "When Wireless Insecurity Strikes" (page 117), the WiGLE site URL (which lists open wireless networks) should have been www.wigle.net.

April's "Lock Down Your PC" should have said that for dial-up connections to the Internet, a software firewall is sufficient protection against attack.

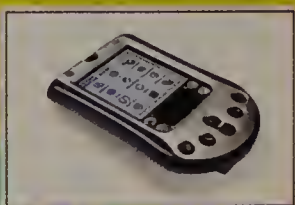
In March's *Top 10 Digital Cameras*, the price of the Toshiba PDR-5300 should have been listed as \$349.

PC World regrets the errors.

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- Generates Random Secure Passwords
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Financial Times

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Wall Street Journal

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We have yet to see a Web-based form stump it.

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- Dell™ 128MB* USB Memory Key, \$39
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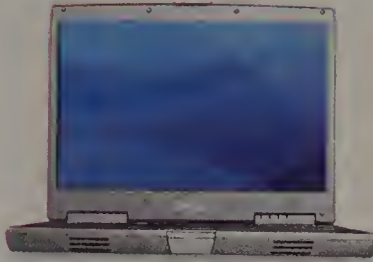
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STEVE FOX

Free Wi-Fi Service Gets Easier to Find

Plus: Better bookmarks, son of Zip, and Intel stops talking gigahertz.



1 Hotspots Heating Up

The Buzz: We've grown accustomed to paying for wireless hotspot access in airports, at Starbucks outlets, and elsewhere, due in large part to Intel's \$300 million marketing splurge promoting its Wi-Fi-enabled Centrino chip. But rival AMD wants to turn the pay-to-play model on its head by promoting free Wi-Fi hotspots in cafés, bars, ice cream shops, and other businesses. AMD expects to see "a groundswell in key metro areas" by the second half of this year. Currently a pilot program, the AMD effort will involve a Web site, promotions, and publicity.

Bottom Line: Initially the AMD hotspot network is tapping businesses that al-

ready supply free Wi-Fi—and there are plenty of them. Trouble is, few people know they exist. Not for long, though.

2 Where'd I Put That Web Page?

The Buzz: You can find anything on the Web, but organizing content for later retrieval—that's another story. Responding to this desperate need are two new search utilities. The full-featured \$30 Onfolio (onfolio.com) snags content—Web pages, paragraphs, links, graphics—from IE or various apps, and saves and organizes it on your PC. Once you've created an Onfolio collection, you can post it online or e-mail it with just a few clicks. A free alternative, Furl (furl.net), lets you grab, share, and organize Web content and archive it to the service's server.

Bottom Line: "Bookmarks on steroids," but without the nasty side effects.

3 Megahertz So Bad

The Buzz: Apparently tired of hyping every bump in speed as worthy of oohs and aahs, Intel is changing the way that it names its chips (see *News and Trends*, page 26). Upcoming mobile Celeron, Pentium 4, and Pentium M processors will boast three-digit names—such as Pentium M 745—denoting the processor

family, cache size, and feature set. Intel was the last holdout, as Apple, AMD, and other chip makers went to a similar naming scheme years ago.

Bottom Line: It's about time, Intel. After all, clock speed—as measured in megahertz and gigahertz—is too simplistic a metric for rating chips. Then again, these new labels are about as intuitive as car-model numbers...as in not at all.

4 90 Gigs to Go

The Buzz: Zip and Jaz had their day. Now Iomega is looking to recapture the magic with the Rev, a storage device that



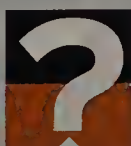
holds 35GB of data (90GB compressed) on a removable disk the size of a deck of cards. Because it's built from off-the-shelf hard-drive technology, the bootable, rewritable Rev is a lot faster than competing tape-backup products. A Rev drive plus one disk will run you about \$400, and additional disks will cost less than \$60 each. At launch, the Rev will come in ATAPI and external USB 2.0 flavors; SCSI and FireWire versions will follow.

Bottom Line: Both "zippy" and "jazzy," Iomega's Rev looks like a winner. ■

NAGGING QUESTION

What's Behind Software Numbering?

ACCORDING TO MY Help menu, I'm not running IE 6; I have version 6.0.2800.xpsp followed by ten more numbers. My NVidia display driver? Version 6.14.10.5664. Huh? Well, taking my NVidia driver as an example, the first five digits indicate Windows



XP; the next four refer to "builds," changes made to the source code. Every week NVidia gathers up all the revisions created by the driver-component teams, creates a build, and adds 1 to that last four-digit string. Think of it as a numbers game, software style.

Contributing Editor Steve Fox covers buzz-worthy products, ideas, and trends. Contact him at steve_fox@pcworld.com. Visit find.pcworld.com/31643 for more Plugged In.

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The Cable-or-Satellite Conundrum

TV lovers finally have a real choice. Here's how to pick the right service.



TELEVISION USED TO be simple: You'd grab the remote and settle in with a cold one to watch the *Monday Night Football* broadcast from your local cable company.

Of course, if you happened to live beyond the reach of civilization as defined by the closest cable conglomerate, things got a little more complicated. You might have had to shell out a thousand dollars or more for a satellite dish the size of a garage door and then spend weeks figuring out how to get it to talk to your TV.

Those days are gone. No longer does satellite TV mean installation headaches

and a large unsightly appendage on your house (now it means a much smaller unsightly appendage). Satellite service has evolved into a direct competitor to the long-monopolistic cable TV industry.

The nation's leading cable companies are countering by expanding and beefing up their own networks, adding services such as high-definition TV signals and movies on demand.

And the battle isn't just about entertainment anymore. Cable and satellite providers also offer services like high-speed Web connections, in some instan-

ces provided by their business partners.

So which technology will offer you the smoother ride to this broadband promised land? If you're considering signing on with a new service, here are a few key considerations to help you decide.

INSTALLATION AND SETUP

Advantage: Cable Aside from the wait for the technician, cable setup is about as hassle-free as it gets. With cable, there's no equipment to buy up front, though you may end up paying a monthly fee of about \$5 to rent a digital cable converter box—which you'll need if you want lots of channels, HDTV, or movies on demand.

Satellite installation is a little more involved. You buy the equipment instead of renting it, though often you'll get a deal in which you receive the equipment and professional installation for free.

Once you have the dish, you must precisely align it to a particular set of coordinates to receive the signal. You'll need an unobstructed view of the southern sky (called *line-of-sight*) and a place to mount the dish where it won't be damaged by high winds or other outside forces.

DirecTV and Dish Network—the two major satellite service providers in the United States—will schedule professional installation and setup for your dish and receiver when you sign up for service.

SERVICE AND SUPPORT

Advantage: Satellite One benefit of cable is that the local office of your cable company handles customer service. The disadvantage? The local office of your cable company handles customer service.

Recent studies conducted by J.D. ►

Power and *Consumer Reports* show poor customer-satisfaction rates among the major cable service providers.

In contrast, the J.D. Power study found, consumers tended to give top marks to DirecTV and Dish Network.

MONTHLY COSTS

Advantage: Satellite One of the most common gripes of cable TV customers is that their bills keep heading skyward with no cap in sight. (The J.D. Power study reported a 41 percent increase in average monthly cable spending between 1998 and 2003, compared with an 8 percent increase for satellite service.)

Still, the monthly costs of cable and satellite service are generally in the same ballpark for roughly comparable packages: You can expect to pay between \$40 and \$50 per month for the most basic dig-

ital cable or satellite service plan. Beyond that, plan prices can rise to \$100 a month or more, depending on features and extras such as HDTV, movies on demand, and premium channels. In general, however, cable tends to have more additional taxes, service charges, and costs for individual features than satellite.

CHANNEL SELECTION

Advantage: Toss-up Satellite might have a slight edge in channels offered, but either service will supply enough variety to effectively obliterate entire blocks of your life.

One key difference: Cable service plans include local and community broadcasting; on satellite, you may have to pay an extra \$3 to \$5 a month for local stations, or you might not be able to get them at all. Both DirecTV and Dish Network list available local stations on their Web sites.

INTERNET SERVICE

Advantage: Cable You can bundle unlimited lightning-fast Internet service right along with your cable package, usually for an additional \$40 or so a month. Though DirecTV and Dish Network offer bundled Internet service (the latter has partnered with EarthLink DSL, and the former sells a satellite-based service called DirecWay), both services are generally slower and more expensive than cable.

FEATURES AND EXTRAS

Advantage: Toss-up In most cases, if you already have a high-definition TV, digital cable will let you watch whatever's being broadcast in that format, as long as you subscribe to those channels and have an HD-capable cable box (the box adds a few bucks to your monthly bill; some com- ►

PRIVACY WATCH

Cut Off Instant Messaging Spam

WITH SPAM FILTERS improving, and some Internet providers (as well as the government) taking legal action against spammers, a growing number of junk mailers are turning to instant messaging to get the word out about their sleazy wares.

This year, spim—spam over IM—messages will number about 2 billion, four times last year's total, according to David Ferris, president of Ferris Research.

Many spim messages tout pornography or fast-money schemes, and include a link to a Web site. Following that link can trigger an avalanche of other privacy and security problems: You may get swamped with pop-up ads, or spyware and Trojan horse apps may install themselves on your PC. And spim can be even more intrusive than spam. Just like a regular IM message, spim can pop up in a chat window on top of whatever you're working on at the time.

Fortunately, all major instant messaging packages let you limit or eliminate spim, but the settings that block it require you to make some trade-offs. Messages from people not on your contact list will be blocked. You'll still be able to add users to your buddy list, but it'll take a few more mouse clicks. It's a good idea to add everyone you think you may want to communicate with to your list before you implement the following tips.

ICQ: Click the *Moin* button, and select *Security and Privacy Permissions*. Click *Communications Events* in the left pane, and then

fill in the radio buttons under either the yellow check mark icon (which limits these actions to users on your contact list) or the red X icon (which prevents anyone from sending you these things). Click *Spam Control* in the left pane, fill in all the check boxes in the right pane, and choose *All users* next to the item labeled 'Do not accept Multi Recipient Messages from'.

AOL Instant Messenger: Press the <F3> key (or click *My AIM•Edit Options•Edit Preferences*) to open the preferences window. Select *Privacy* in the left pane, and then choose the *Allow only users on my buddy list* option under the 'Who Can Contact Me' header.

Yahoo Messenger: Click the *Login* menu and choose *Preferences*. Select the *Privacy* item in the left pane of the Yahoo Messenger Preferences window, and choose *Ignore anyone who is not on my Friend list*. To prevent spim through Yahoo's Web interface, choose *Do not allow users to see me online and contact me* in the 'When people see my ID on Yahoo Web sites' section.

MSN Messenger: Once you're logged in, click *Tools•Options*, and then select the *Privacy* tab. Fill in the *Only people on my Allow List can see my status and send me messages* check box. The Privacy tab also has controls for adding or removing people on the Allow List, as well as a button that lets you see which other MSN Messenger users have added you to their contact list.

—Andrew Brondt



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ON YOUR SIDE

Digital Camera Goes Kaput

W MY HP PHOTOSMART 612 digital camera was scarcely four months out of the one-year warranty when it conked out. I read the forums on HP's site and found complaints about the same problem happening with other 612 units shortly after the warranty ended. I have not located any explanation of the problem in HP's online tech support. The only option that HP leaves people is to pay to replace the PhotoSmart 612 with a refurbished model and hope that the problem doesn't happen again.

Alex Nord, Clarkston, Michigan

On Your Side responds: This issue has affected less than half of 1 percent of PhotoSmart 612 users who have called HP tech support, says Jim Kemp, HP's director of consumer and support planning infrastructure. The fact is, Kemp says, "cameras fail." If a camera fails and is out of warranty, the user can exchange it for a current, refurbished HP camera with more features. Upgrading to a PhotoSmart 635 will cost \$120; a PhotoSmart 735, \$160; and a PhotoSmart 935, \$280. These cameras come with 90-day warranties.

—Grace Aquino

panies charge about \$50 for installation).

To watch HDTV via satellite, you'll need a special HD dish and receiver, which typically start at about \$400 (though you can sometimes find less expensive deals if

you sign a long-term contract). On top of that, plan to add another \$10 or so per month for an HD package that includes sports, movies, HBO, and more.

Another hot feature is a TiVo-like digi-

tal video recorder built into your set-top box. This feature costs cable subscribers about \$10 a month, where it's available. Satellite customers can plan on paying \$250 or more for a DVR (though DirecTV is currently offering the device for about \$100), plus about \$5 a month for service.

AND THE WINNER IS...

IF BUNDLED INTERNET service is important to you, cable is likely the answer. If you want a choice in providers, and attentive customer service, your solution might be a mere 22,000 miles away. ■

Anne Kandra is a contributing editor and Grace Aquino and Andrew Brandt are senior associate editors for PC World. You can send them e-mail at consumerwatch@pcworld.com. If you would like to read previously published Consumer Watch, Privacy Watch, or On Your Side columns, visit find.pcworld.com/31703, find.pcworld.com/31706, or find.pcworld.com/31709, respectively.

THE Best of Both Worlds

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DIGIC DV • PRINT & SHARE

Still photos or video? The decision should be up to you—it shouldn't be driven by what kind of equipment you're carrying. And with DV Photo Plus, Canon Mini DV camcorders give you unprecedented clarity, sharpness, and quality whether you're taking still photos or capturing video memories. Canon's DV Photo Plus achieves premium-quality video and stills by combining four key technologies: Genuine Canon Optics, the exclusive DIGIC DV Image Processor, a Megapixel CCD, and Print & Share, which lets you print to any Canon

Canon Mini DV Megapixel camcorders deliver superior VIDEO AND PHOTOS

or PictBridge compatible printer.

But it doesn't stop there. Select Canon Megapixel camcorders come with an RGB Primary Color Filter for more accurate color gradations, so that what you see is what you get. What's more, all these state-of-the-art camcorders shoot in the high-resolution 16:9 aspect ratio, so now you can play back those memorable moments on your widescreen TV.

Canon Megapixel camcorders can be an integral part of any home theater environment. Flexibility, control, precision, user-friendliness: It's all yours with Canon's Mini DV camcorders.



optura 300

- 10x Optical Zoom
- 2.2 Megapixel CCD
- RGB Primary Color Filter
- Image Stabilizer



optura 40

- 14x Optical Zoom
- 2.2 Megapixel CCD
- RGB Primary Color Filter
- Image Stabilizer



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- 11x Optical Zoom
- 2.2 Megapixel CCD
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- Optical Image Stabilizer



ELURA 70

- 18x Optical Zoom
- 1.33 Megapixel CCD
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EVERYTHING YOU'VE ALWAYS WANTED EVEN THOUGH YOU'VE NEVER

OPTICS • MEGA PIXEL CCD



DIGIC DV • PRINT & SHARE

Let's start with the first thing you should know. DV Photo Plus refers to the four key technologies

that give you both premium-quality video and photos from a single camcorder. And assuming that's not everything you wanted to know, here's the rest.

GENUINE CANON OPTICS

All Canon Mini DV camcorders feature high-precision lenses designed specifically for camcorder use. But did you know that each of our camcorders has a unique lens that matches its CCD for optimum quality? Or that our camcorder lenses are made with the same expertise used to create lenses

for professional photographic cameras and broadcast TV cameras? That's surely worth knowing.



Especially since your fabulous home videos will undoubtedly be broadcast to your friends and family during holidays and get-togethers.

MEGAPIXEL CCD IMAGE SENSOR

No matter what you're shooting, you'll get crisp images with life-like detail because of this Megapixel CCD. First it captures the image. Then it registers it. And then

the image processor converts the pixels into both great video and great photos. Now, on to the brains of the operation.

DIGIC DV IMAGE PROCESSOR

DIGIC DV is your camcorder's digital brain; you'll find one in every Canon Mini DV camcorder. This exclusive image processor captures accurate color for both video and digital photos. And like the human brain, DIGIC DV will help





TO KNOW ABOUT DV PHOTO PLUS. HEARD OF DV PHOTO PLUS.



PRINT AND SHARE

Print and Share makes it easy to print photos directly to a printer or to transfer images onto your computer. Simply connect the camcorder to any Canon printer or PictBridge compatible printer, select an image and voilà: you can print it for your family and friends. It's almost like having your own private photo lab.



SO THERE YOU HAVE IT

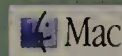
Everything you've always wanted to know about DV Photo Plus. Not just video and photos, the best of both.

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Mini **DV**

» Lite-On IT is Right On with a Beautiful Design, Easy Operation, and Competitive Price Points

SOLID TO THE CORE



The LVW-5005 DVD Recorder allows users to record on most popular recordable optical disc formats.

When it comes to buying DVD recorders and other digital optical technology, consumers need to ask, "What stands behind these products? How dependable is the vendor? How solid is the technology and engineering integrated into these products? Do these products offer the most robust features at competitive prices?"



Lite-On IT's user-friendly new DVD Recorder offers an "Easy Guider" menu design.

Now fill in the answers you would want to see. You'll find you have described the products of a company that is a world leader in DVD recorders and optical drive technology. This is a company where scores of engineers have dedicated themselves to crafting patented anti-vibration mechanical designs and advanced circuit design that deliver unparalleled performance and value to its customers. That company is Taiwan-based Lite-On IT Corporation,

with US headquarters in Milpitas, CA (www.liteonamericas.com).

Lite-On IT relies largely on its own high-volume manufacturing capabilities and patented technology to create products of peerless quality. With the introduction of Lite-On IT's "All-Write" technology, initially launched on the new LVW-5005 DVD Recorder, users can now fulfill their dreams of recording on most popular recordable optical disc formats, including DVD+R/RW, DVD-R/RW, and CD-R/RW. This benefits many consumers by removing the confusion associated with which DVD format to choose. Similar advanced technologies and focused engineering initiatives place the consumer in much closer touch with the innovative Lite-On DVD Recorders.

INNOVATION AND INTELLIGENCE

Introduced in January 2004, the LVW-5005 DVD Recorder offers consumers a suite of powerful, user-friendly recording options in a super-sleek silver box. The innovation and engineering superiority built into this product are obvious from its menu design, appropriately called "Easy Guider," and the on-screen Timer Record function, which allows users to view the channel they want to record while they set the channel in the timer "window."

Other advanced features and functions of the LVW-5005 DVD Recorder include:

- Ability to write to both the DVD-R/RW and DVD+R/RW formats
- Ability to record audio and video from any audio or video source to CD-R/RW
- The innovative DV Link (1394) Camcorder Connection
- A simple Guider button that walks users through the standard processes of Recording, Playback, Erasing, or Finalizing DVD Recorder operations
- Advanced, user-friendly "Easy Guider" and Setup navigation with on-screen menus

You can easily and quickly select any recorded video programs at a glance with the LVW-5005 DVD Recorder from the Playback menu icons. You can also edit each video program title that has previously been recorded.

It's true, not all DVD recorders are created equal. Lite-On IT, with its history of high-volume production and innovative engineering backed by dedicated R&D investments, has stepped to the front of the pack when it comes to delivering superior-quality products at very attractive prices.

For more information on Lite-On's LVW-5005 DVD Recorder, visit www.liteonamericas.com.



STEVE BASS

Instant Relief for a Day Full of “Ooops!”

These eight tools and tips are sure cures for your common computing uh-ohs.

SO HOW WAS MY DAY? The printer stopped working, I permanently deleted a critical file, and my hard drive started whining, asking for early retirement (something I was ready for, too). And I hadn't even made it to my morning coffee break.

What, me worry? Not a chance. I have a cellarful of tricks, utilities, and strategies that save my bacon regularly.

My last stomach-churning adrenaline rush occurred when my hard drive wouldn't boot. (This time I was dumb lucky: I had simply left a floppy disk in the drive.) I've developed a strategy for when it's the real deal, though.

I keep the Ultimate Boot CD nearby. Not only can I boot my system with this freebie, but the disc contains 46 utilities that help me figure out what's wrong, including hard-drive troubleshooters and partitioning tools. Visit find.pcworld.com/41600 to download this program, and then just burn it to a CD.

Another tool in my snafu kit is Acronis's \$50 True Image drive-imaging program, which I use to create an exact image of my hard drive on a CD, a DVD, or an external storage device. It took only about an hour to image my 60GB drive for the first time, and incremental backups (which I do about every two days on average) take about 15 minutes to complete. Using Windows Explorer to retrieve files from the image is a no-brainer, and True Image also creates an emergency boot CD for you to use if you have to restore the entire drive. With True Image, there's no excuse for not backing up. Point your browser to find.pcworld.com/41633 to download the trial version.

Making immediate, automatic copies of crucial files is another way to avoid grief.



Whenever I work on a file, I tell Second Copy to place it on my backup hard drive every 3 minutes. Paranoid? Sure, but I like knowing that the last 30 files and folders I opened are safe. And for ultra-important files like my QuickBooks data file, I have Second Copy archive subsequent copies via the 'how' tab in the program's Profile Wizard. Browse to find.pcworld.com/41615 to download the free trial version.

BRING BACK THAT FILE

IT TAKES ONLY a nanosecond to delete a file. Usually, the file lands in the Windows Recycle Bin, where you can recover it almost as fast. But stuff happens: My buddy Gabe once deleted a valuable 500MB video file that was too big for the Recycle Bin (the default storage limit is 10 percent of your hard-drive capacity). If you hold the <Shift> key while deleting, the erasure is permanent. And when you empty the Recycle Bin, the files are history.

Of course, "deleted" files don't vanish—the file name's first character is removed, but the file remains on your hard drive until it's overwritten by another file.

That's why you need a file-recovery util-

ity like PC Inspector Smart Recovery, which restores image and video files in over 25 formats on memory cards, or PC Inspector File Recovery, which retrieves 26 file types from FAT32- and NTFS-formatted hard drives. Go to find.pcworld.com/41636 to download Smart Recovery, and visit find.pcworld.com/41639 for File Recovery.

Recovering a deleted file is easier if you keep your drive defragged and act fast. Before you run a recovery tool, close all other apps. Save the restored file to a different partition or hard drive, or to external media. Visit find.pcworld.com/41642 for tips from last December's *Answer Line* column on recovering files that aren't in the Recycle Bin.

If your printer goes on the blink when you have important files to print, find a friendly local hotel and send the documents to its printer using www.printeron.net. Or upload them to Kinko's Web site at www.kinkos.com; the site will ship the printouts to you via FedEx, or you can arrange to pick them up at a local branch. Or try a service that lets you e-mail a document to your fax machine (check out find.pcworld.com/41645 for a list of free fax services). I once used FinePrint's \$50 PdfFactory (www.fineprint.com) to save a user-group newsletter as a PDF and then sent the PDF file to a buddy's printer.

If a product has ever saved *your* bacon, tell me about it. You may see it in one of my upcoming newsletters. Browse to find.pcworld.com/41754 to sign up. ■

Contributing Editor Steve Bass is the author of PC Annoyances, published by O'Reilly. Go to find.pcworld.com/41648 to download the PDF version of the e-mail chapter. Contact him at homeoffice@pcworld.com.

SPAM

We don't care if you eat it, we just don't want you to have to read it.

That's why all of Hostway's Web hosting plans include Hostway **CleanMail™**, the ultimate spam and virus filter. **CleanMail** blocks spam from cluttering your email box and keeps viruses from infecting your computer.

CleanMail is just one of the exceptional features you can expect when you choose Hostway as your hosting provider. Find out what other goodies we have for you to sink your teeth into. Visit www.hostway.com/pcw.

CleanMail Facts

Serving Size: All Web hosting plans

Amount Per Serving

Calories 0 **Calories from Fat** 0

% Daily Value*

Spam Filter **100%**

Virus Blocker **100%**

Total Carbohydrate 0g **0%**

Dietary Fiber 0g

Sugars 0g

*For more information, please visit:

www.hostway.com/pcw

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BUGS & FIXES

STUART J. JOHNSTON

Worms Come Faster: Are You at Risk?

Play it safe and install the latest Outlook and MSN Messenger updates.



I RECENTLY spent a day visiting Microsoft in Redmond, Washington, along with some other *PC World* editors. We quizzed several folks from Microsoft's Security Response Center on patches and security. You may already know that

most worms exploit holes that have already been plugged. But you might not be aware that new worms are appearing much faster after the release of a patch.

Iain Mulholland, lead security program manager at the Security Response Center, says that hackers often use reverse engineering on Microsoft's patches to concoct their worms. After a particular fix has been released along with the technical details about the vulnerability, the so-called black-hat hackers go to work.

The bad news is that the time between the posting of a patch and the debut of a worm aimed at exploiting the original weakness has become drastically shorter. Remember Nimda? Microsoft says that crackers took almost a year—

331 days—after the company released a fix for the Nimda vulnerability to unleash their attack in 2001. Two years later, the Blaster worm arrived just 25 days after Microsoft put out the corresponding patch.

So be forewarned: Now is a good time to get a new fix for Outlook 2002 and one for MSN Messenger 6.0 and 6.1.

If you are running Outlook 2002, the latest critical flaw could let a scoundrel disguise a worm in an innocuous-looking HTML e-mail, or plant a link in an e-mail that would lead you to a contaminated Web site. Once activated, the worm would execute the hacker's attack program on your PC, and it could delete every one of your files, just for fun. (You're safe if you've already installed Office 2002 Service Pack 3—or if Outlook 2002 isn't your default e-mail program.) Nobody has reported any exploits yet, but I urge you to take care of this problem. Go to find.pcworld.com/41762 to install the patch.

The other hole, while less serious, could still cause Excedrin Headache 2004. If you use MSN Messenger 6.0 or 6.1, an attacker could slip you an instant message that, while invisible to you, would allow someone to read files on your PC remotely. (However, if you've blocked anonymous users, you're protected.) The

bad guy would need to know your sign-in name and the names of files on your system. Head to find.pcworld.com/41764 to grab the fix. ■

Stuart J. Johnston is a contributing editor for PC World. Visit find.pcworld.com/31580 to see more Bugs and Fixes columns.

IN BRIEF

Big Blue Update

IBM HAS A downloadable firmware upgrade to fix reliability problems in some 60GB and 80GB hard drives in its ThinkPad R50, R50p, T41, and T41p laptop PCs. Go to find.pcworld.com/41770 to learn how to tell if your hard drive needs the update—and to find a link to the fix.

New Norton Flaws

SYMANTEC patched a hole in its Norton Internet Security 2004 products that could let an attacker take over your PC. You need to run Symantec's LiveUpdate program to get the patch. Go to find.pcworld.com/41772 for details about the ins and outs of LiveUpdate.

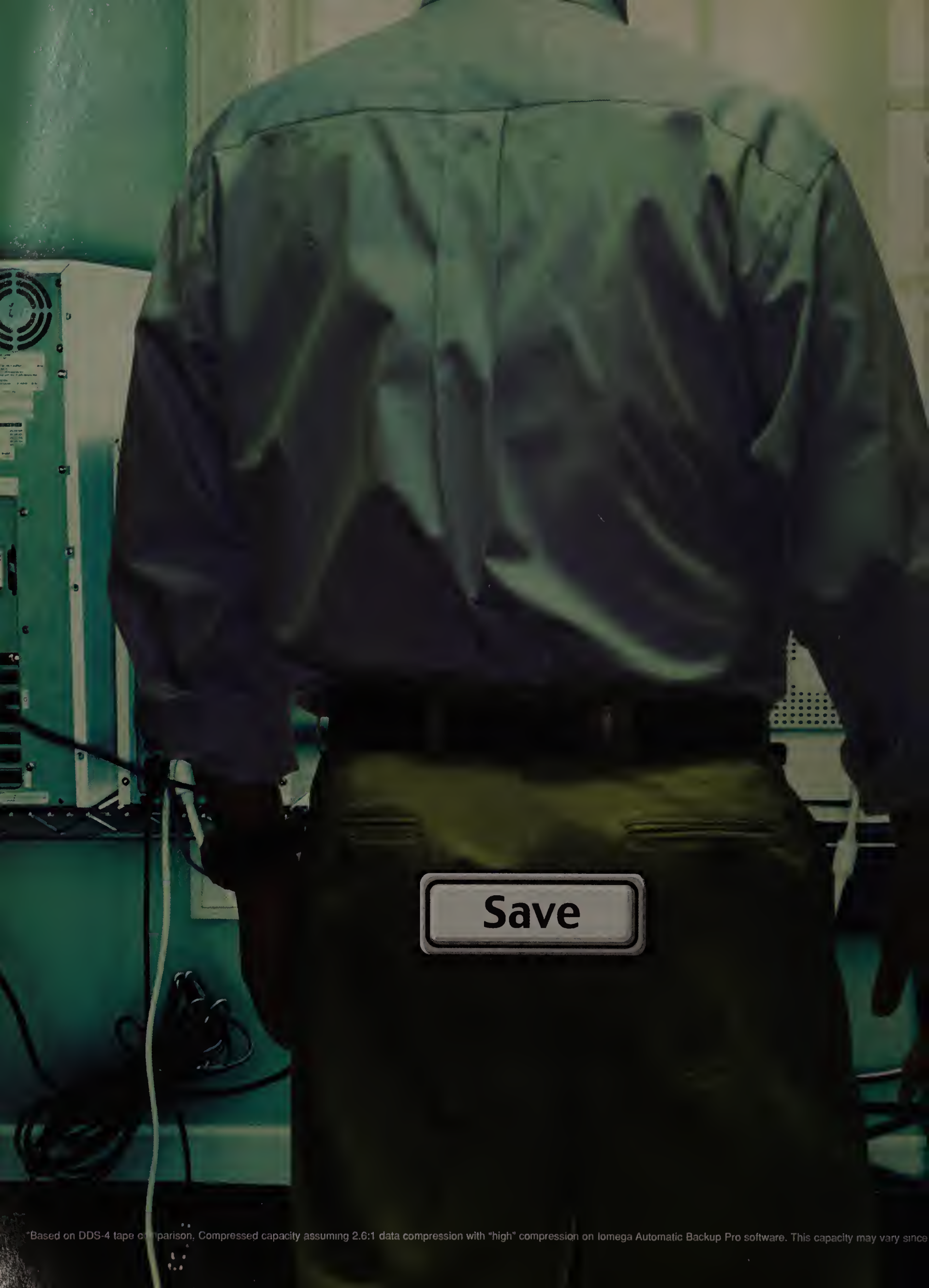
BUGGED?

FOUND A hardware or software bug? Tell us about it via e-mail at bugs@pcworld.com.

ATTACK ON POPULAR FIREWALL PROGRAMS

IF THERE WAS ANY DOUBT that crackers are more quickly figuring out how to exploit newfound security holes in popular software, take a look at Internet Security Systems' BlackICE and RealSecure. Only two weeks after security research firm EEye Digital Security informed ISS of a serious flaw in these products, a miscreant cooked up a worm dubbed Witty that isn't at all amusing (see find.pcworld.com/41766 for details).

The worm replicates by sending copies of itself to randomly scanned Internet addresses, but it infects only PCs with one of these products running. Witty gradually erases key portions of an infected PC's file system code. Though it doesn't do its damage all at once, the end result is the same. The hole is present in both desktop and server editions of the products, though not in all versions. Visit find.pcworld.com/41768 for a link to the fixes.



Save

*Based on DDS-4 tape comparison, Compressed capacity assuming 2.6:1 data compression with "high" compression on Iomega Automatic Backup Pro software. This capacity may vary since

SAVE EVERYTHING.

NEW



THE IOMEGA REV DRIVE

Say goodbye to tape drives. For a fraction of the cost, the Iomega REV drive gives you removable storage with hard disk performance that's up to 7x faster. With 35GB/90GB (compressed) disks you can backup your data, protect your system and save everything.*



saveeverything.com

NEW PRODUCTS

EDITED BY ANNE B. McDONALD

Video IM Services Face Off

Paid apps promise better voice syncing than their no-cost competitors. But is it just lip service? We put three to the test.

INSTANT MESSAGING

WHEN FACE-TO-FACE meetings are impossible and telephone calls do not suffice, video instant messaging can bridge the gap. Although free video IM services exist, a few dollars a month can buy you features those services don't offer, including realistic voice sync, added functionality, and improved connectivity behind routers and firewalls.

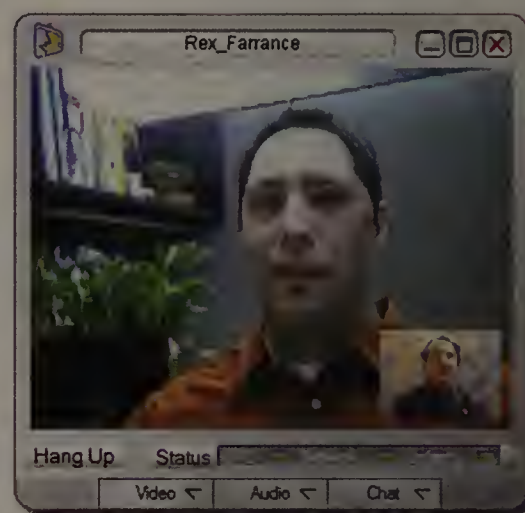
We tested three video IM services that promise high-quality video and audio, reliable connections, and an easy learning curve: the shipping version of SightSpeed's **SightSpeed Video Messenger** (\$5 per month or \$50 per year), and beta versions of NetGen Video's dial-up-friendly **Clique Video Messenger** and Logitech's elegant-looking **VideoCall**. In our tests—using Logitech QuickCam Orbit Webcams (see page 61), a PC running



CLIQUE VIDEO Messenger (above), **SightSpeed Video Messenger**, and **Logitech VideoCall** (right). Actual video quality may vary from that depicted here.

Windows 2000, and a notebook with XP Professional—all three fee-based services worked not only through a corporate firewall, but also with a home-networked user on one end. The freebie services sometimes have trouble piercing firewalls and routers.

The largest distraction involved in using video IM is the delay between voice and picture. SightSpeed Video Mes-



senger's excellent voice sync and short turnaround time permitted me to converse normally with a fellow tester, despite tinny audio and sometimes blurry images. The test participants freely interjected comments and were able to interrupt one another on this broadband-only service. Text messaging, once summoned, appears underneath the video window. SightSpeed's dialog

boxes told us where we went wrong when we attempted to install an unsupported camera or run the software on an unsupported OS. When the DSL connection of the person I was conversing with choked on the large images I chose, SightSpeed automatically resized them smaller and then alerted us. SightSpeed also installed a tech support contact in our contact lists.

58 VIDEO INSTANT MESSAGING SERVICES

Clique Video Messenger, Logitech VideoCall, SightSpeed Video Messenger

59 WEBCAMS

Creative WebCam NX Ultra, Logitech QuickCam Messenger, QuickCam Orbit

60 MULTIFUNCTION PRINTER

Hewlett-Packard Officejet 9130 All-In-One

NOTEBOOK

Dell Computer Inspiron XPS

62 DIGITAL CAMERA

Canon PowerShot S500 Digital Elph

DIGITAL CAMERA

Nikon D70 Outfit

69 DATABASE MANAGEMENT

FileMaker Pro 7

HOME THEATER

Pixa DHT-100

70 DISC DUPLICATION

Primera Technology Bravo II Disc Publisher

70 VIDEO TRANSFER

Plextor ConvertX PX-M402U

72 PORTABLE PRINTER

Canon i80 Color

Bubble Jet

Printer

73 SURVEY SOFTWARE

Quask

FormArtist

Professional Edition



70

If you are using dial-up, Clique Video Messenger is your only option among these three services. The company strongly recommends a broadband connection for its Video Chat feature, however.

When we tested Clique over broadband, it delivered decent video quality at different image sizes, but with tinny audio. And its voice-sync quality—though acceptable—fell short of SightSpeed's.

We had to dig through the menus to find some Clique functions, but we uncovered a wealth of features for customizing the data flow to maximize limited bandwidth (such as controlling the sent and received bit rates). At press time, NetGen Video had not determined pricing for its service, which should be available by the time you read this.

SEND VIDEO CLIPS

CLIQUE'S standout feature isn't its video IM capabilities, but another part of its service: recorded click-to-send Video Instant Messages, which basically are video clips you create and send to a recipient, who can play them back at leisure. To start and finish your VIM, you click a Record button; another button sends it on its way. When received, the clip appears as a thumbnail image in your partner's Clique text window. Clicking the thumb-

nailed plays the VIM, which delivers a default resolution higher than that of Clique's real-time Video Chat.

KEEP IT SIMPLE

WE FOUND the slick, one-window interface in Logitech's VideoCall the easiest to use of the three. We appreciated the phone-like ring tone that alerts you to an incoming call, and the photo address

book on the interface's right side. VideoCall's audio quality was the best in the group. That said, this broadband-only service is better suited for one-sided monologues than for spontaneous verbal exchange: Lagging voice sync frustrated us, and the video looked distractingly jerky. This program lacks a text window, too; if you need to type something out, you have to open a separate

text IM program. Logitech has slated VideoCall for release in mid-June; as of this writing, it was not priced.

These three services soon will get a major competitor: AOL plans to launch its own paid video IM service. Until then, SightSpeed Video Messenger's ease of use and life-like voice sync make it tough to beat. Keep your eyes peeled.

—Laura Blackwell

Clique Video Messenger

NetGen Video

Preproduction version, not rated

Videoclip feature adds vigor to merely competent video chat.

Not priced at press time

find.pcworld.com/41898

VideoCall

Logitech

Preproduction version, not rated

Poor audio-video synchronization despite sleek video interface.

Not priced at press time

find.pcworld.com/41900

SightSpeed Video Messenger

SightSpeed

★★★★☆

Dead-on lip sync; worth the fee.

List: \$5 per month, \$50 per year

find.pcworld.com/41904

Webcams Watch Your Every Move

W E B C A M S

TO GET connected with video instant messaging, you need a Webcam. Here's a quick look at three shipping models.

The \$150 autofocus Logitech **QuickCam Orbit** (find.pcworld.com/41914) mounts on an included 9-inch stalk, and it mechanically rotates and tilts to keep your face in the frame when you stand up or move around.

Creative's \$90 **WebCam NX Ultra** (find.pcworld.com/41910) perches on the top bezel of most notebooks and

LCD monitors. It transmitted crisp sound, and an included headset limits noise pollution. Face-tracking software allows the camera to follow you if you move your chair.

The no-frills \$50 Logitech **QuickCam Messenger** (find.pcworld.com/41912) uses the same interface as the Orbit, but it doesn't give you that model's face tracking and other automatic features.

Its video quality is good enough for casual use. The familiar "eyeball on two feet" shape will park sturdily on your CRT monitor.

—Laura Blackwell

FROM LEFT: Creative WebCam NX Ultra, Logitech Messenger, Logitech Orbit.



All-in One Tries Too Hard

MULTIFUNCTION PRINTER

TEST Center

WITH THE release of its **Officejet 9130 All-In-One**, Hewlett-Packard is attempting to woo office workgroups, accustomed to monochrome laser printers, over to color inkjet multifunction printers. The 9130 is equipped with network capability and high-capacity ink cartridges for heavy use. But in our tests of a preproduction unit, its print speeds weren't suitable for a clutch of office users.

Officejet 9130 All-In-One

Hewlett-Packard
Preproduction unit, not rated
High-end multifunction inkjet is
too slow for workgroups.
Street: \$999
find.pcworld.com/41906

The 9130, which costs \$999, features a legal-size flatbed scanner, a 50-page automatic document feeder, a duplexer, and a four-slot flash memory card reader. It supports PC-free color copying and color faxing. In addition, the device comes with an ethernet network card and a second paper tray, for a total paper capacity of 400 sheets.

The 9130's innovation is a pop-out QWERTY keyboard, useful for entering names with fax numbers in the unit's on-board phone book. It also assists in what HP calls "digital sending": When the 9130 is properly set up on a TCP/IP network, you can type in an e-mail address and transmit a scan as an attachment, or scan

and save the files in network folders. The device is able to route incoming faxes as e-mail attachments to network mailboxes or files, as well.

Here is this all-in-one's real contradiction: Even though the digital-sending features are appropriate for a big office with IS support, our preliminary tests show only enough speed to satisfy individual users—our 9130 output text at 5.4 pages per minute, printed a glossy photo in 4 minutes and 20 seconds, and copied black text at 3.2 ppm. I did like its sharp black text and smooth color glossies. The device copies black text well and color graphics with



HP'S OFFICEJET

9130 has a pop-out keyboard.

surprising color accuracy.

Unless a shipping model tests better, though, the 9130's high price and the mismatch between its inkjet print speeds and its network capabilities make it a dubious choice for individuals and workgroups.

—Dan Littman

Power-Gaming Dell Laptop

NOTEBOOK

TEST Center

DELL'S NEW gaming notebook series, the **Inspiron XPS**, combines top-tier Intel desktop processing oomph, via the 3.4-GHz Pen-

tium 4 Extreme Edition chip, with a 128MB ATI Radeon 9700 graphics chip for smooth video and game playback. It will cost you a hefty \$4349, but that includes access to a special queue of tech support reps with gaming know-how. For an additional fee, a Dell technician will come to you to install graphics upgrades.

Our shipping unit performed well, scoring 125 on PC WorldBench 4 (not a specific gaming test). That

wasn't quite enough to beat a Voodoo Envy M:855 gaming laptop with a 134 score at a resolution of 1024 by 768 pixels, but the XPS was on a par with 1.7-GHz and 1.6-GHz Pentium M systems we have tested. The XPS's high native resolution of 1920 by 1200 probably slowed performance; a lower resolution likely would up the score. (For more test results involving the P4 EE, go to find.pcworld.com/42130.)

This laptop carries pretty much everything a traveling gamer would want, including 1GB of RAM, a 60GB hard disk, a 15.4-inch wide-aspect LCD screen, and a 4X/4X/8X DVD+R/RW and 16X/10X/24X CD-RW combination drive in a modular bay.

You also get external controls for sound and the optical drive, as well as one FireWire

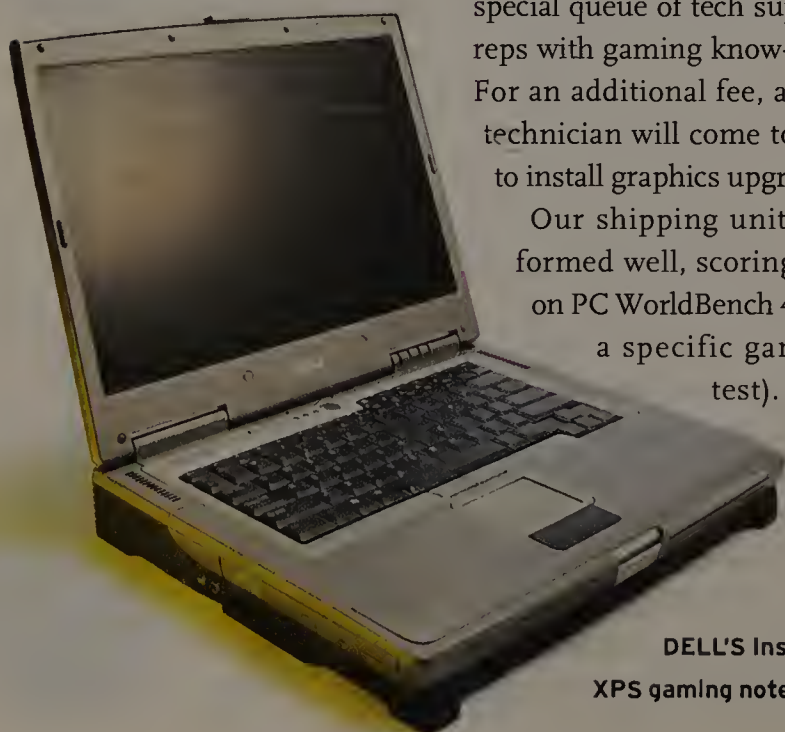
port, four USB 2.0 ports, an ethernet port, a 56-kbps modem port, a PC Card slot, and built-in Wi-Fi.

Game images were smooth. The stereo sound, complete with a subwoofer, produced good bass and above-average notebook audio.

Like those on most gaming laptops, the XPS's 12-cell battery died young (after 1 hour, 44 minutes). The XPS weighs 11.8 pounds with AC adapter.

Still, its top-notch video and good sound will please deep-pocketed gaming fans.

—Anush Yeghazarian ■



DELL'S Inspiron
XPS gaming notebook.

Inspiron XPS

Dell Computer

★★★★☆

Street price: \$4349

A fine but pricey performer with smooth video and game play.

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NEW ALIENWARE DHS DIGITAL HOME SYSTEMS. ENTERTAINMENT REDEFINED.



Alienware presents a new line of high-performance digital home systems that will change the way you think about home entertainment. Powered by Microsoft® Windows® XP Media Center Edition 2004, Alienware DHS systems combine the functionality of six electronic devices in a sleek and silent unit that fits seamlessly into your entertainment center.

- Record, pause, and play back live TV with a personal video recorder that works similar to a TIVO®
- Create your own digital library by recording, burning, and storing up to 5000 CDs and 235 hours of video¹
- Download on-demand movie titles and music through CinemaNow, Movielink,™ and Napster™
- Play games, surf the web, and email friends or work from home with Microsoft Office software²
- Connect to a plasma, LCD, CRT, or HDTV display for a state-of-the-art viewing experience



DHS-301™

Exclusive Alienware® DHS Chassis
Intel® Pentium® 4 Processor with HT Technology 2.80GHz
High-Performance Heatsink Cooling System
256MB PC-3200 DDR SDRAM at 400MHz
ATI® RADEON™ 9600XT 128MB Ultimate with Silent Thermal Protection
80GB 7200RPM Serial ATA100 with 8MB Cache
Creative Sound Blaster® Audigy 2™ ZS 7.1 Advanced 24-bit Audio
CD-RW/DVD Combo Drive
Alienware® 8 in 1 PRO Media Reader
Gyraton® Wireless Keyboard and Mouse
Microsoft® Windows® XP Media Center Edition 2004
Optimized & Configured for High Performance
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1-Year Personalized Online Support Portal with Chat and Forums
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\$1,779.00 or as low as **\$54/mo.³**
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ACCESSID: PCW0604PD1

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Exclusive Alienware® DHS Chassis
Intel® Pentium® 4 Processor with HT Technology 3.20GHz
High-Performance Heatsink Cooling System
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4X DVD±R/RW Drive
Gyraton® Wireless Keyboard and Mouse
Optimized & Configured for High Performance

\$2,979.00 or as low as **\$90/mo.³**
After \$100.00 rebate.

ACCESSID: PCW0604PD3

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AND OTHER GREAT PROMOTIONS. APPLY ONLINE!

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Small Camera, Big Picture

DIGITAL CAMERA

CANON EXPANDS its popular pocket-size Digital Elph line with the \$499 **PowerShot S500**, whose best new features include 5-megapixel capability, easier photo printing, and a shutter lag-reduction mode.

The camera's Print/Share button makes photo printing easier. When you connect the S500 to a USB port on your computer or to a direct-print

printer from Canon (or another printer that supports the industrywide PictBridge standard), the button glows blue. You can then browse through photos on the camera's LCD screen and press the button to print them. You can even use the S500's zoom controls to crop your print or to print a sequence of movie frames.

You can use the Print/Share button to transfer images automatically, too. You access the Direct Transfer menu to choose whether to transfer all photos or just the new ones. Alternatively, you can decide to download your images one at a time as you view them on the S500's display.

To reduce the shutter lag

typical with digital cameras, the S500's new Quick Shot mode freezes the LCD while the camera is autofocus, allowing the shutter to fire almost instantaneously.

Like its predecessors, the S500 is short on scene modes, but its automatic mode produces good results. You can get more out of the camera by manually setting the white balance according to the light conditions, adjusting the ISO sensitivity, setting exposure compensation, or locking the focus. A 3X optical zoom, a 32MB CompactFlash card, and a rechargeable lithium ion battery are included.

In my tests with a shipping model, the LCD was easy to see in bright sunlight. The 5-megapixel CCD sensor really captured details and vivid col-



FIVE MEGAPIXELS: Canon PowerShot S500 Digital Elph.

ors, as I saw when I filed and printed my photographs by way of the easy-to-use included Canon software.

When you first pick it up, you may be surprised at how heavy the S500 is. But this Canon packs a lot of power.

—Paul Jasper

PowerShot S500 Digital Elph

Canon

Not rated, pending Top 100 tests
Great Digital Elph adds higher resolution, easier connectivity.
Street: \$499

find.pcworld.com/41916

Nikon's Digital SLR Camera

DIGITAL CAMERA

FOR USERS OF single-lens reflex cameras, moving from film to digital can take a heavy toll on the pocketbook. SLR body prices jump from hundreds of dollars for a film camera to thousands for a digital model, which is why most digital SLR manufacturers have concentrated on the profes-

sional market—until recently.

Nikon's 6.1-megapixel **D70 Outfit** is the company's first model designed for photographers of all stripes. Sold body-only for \$999 or as a kit with a 27mm-to-105mm lens (35mm equivalent) for \$1299, the D70 is relatively inexpensive for a digital SLR. Only Canon's 6.3-megapixel EOS Digital Rebel costs less, at \$899 (body only).

The D70 has features you don't typically

find in today's digital SLRs. For example, it provides six scene modes, such as Portrait, that are useful mostly to photographers not comfortable with arcane camera settings. Pressing the D70's Help button pops up brief descriptions of the menu-based settings.

Novice-friendly does not mean that advanced photographers get shortchanged: The D70 has a slew of fine-tuning options for exposure settings, such as a variety of autofocus modes, depending on the subject you're shooting. And the camera's exposure-bracketing options are highly flexible. The D70 works with most of Nikon's modern lenses, including "AI" models. However, the older the lens, the less automation you get. "G" series lenses provide the best combination of lens and body.

Still, a day's shooting with

the D70 left me somewhat disappointed. The eye-level viewfinder seems small and slightly awkward to use, especially when you're wearing glasses. And shooting in default mode may produce slightly underexposed or muted color shots, though you may be able to improve these by adjusting the camera settings before trying again or by running the shots through a photo-enhancement filter in Nikon's bundled Picture Project software.

But otherwise, the D70 has quick startup, fast focus lock, and fairly intuitive controls.

—Tracey Capen ■



NIKON D70 Outfit.

D70 Outfit

Nikon

Not rated, pending Top 100 tests
Best way for owners of 35mm Nikon SLRs to migrate to digital.
Street: \$1299 with one lens
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Sony recommends Microsoft® Windows®
XP Professional for Mobile Computing.

SONY

There's only one PC that's made by Sony
and customized by you.



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Sony® VAIO® notebooks and desktops offer power and multimedia capabilities all wrapped up in a stylish package. Think of what you want in a PC and you're sure to find a Sony VAIO® that fits you perfectly. And best of all, every Sony VAIO® PC is designed and built to work with other Sony products and accessories. So you get great results and the same quality and dependability you've come to expect from Sony.

Sony VAIO® V505 Series Notebooks feature Intel® Centrino™ Mobile Technology.



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Sony VAIO® Notebook PCs with Intel® Processors. Whatever you set your sights on, you can get it done and do it better with a Sony VAIO® Notebook PC. With build-to-order versatility, wireless capability, interactivity and mobility, now it doesn't matter where you are, thanks to Sony VAIO. Because there's no limit to how far you can go.

Sony recommends Microsoft® Windows® XP Professional for Mobile Computing.



**Compact Design
TR Series**

PCG-TR3A

Featuring Intel® Centrino™

Mobile Technology

- Ultra-low-voltage Intel® Pentium® M Processor 1GHz¹
- Intel® PRO/Wireless Network Connection 802.11b/g¹⁶
- Intel® 855 Chipset
- Microsoft® Windows® XP Home Edition
- 40GB² Hard Drive
- 10.6" widescreen XBRITE™ LCD display
- 512MB RAM
- Integrated CD-RW/DVD Combo Drive⁴
- Amazing battery life up to 5.5 hours⁶
- Integrated swivel camera
- Sleek design in a 3.11 lb. light⁵ and 1.44" thin body
- 1-Year Limited Warranty³

\$2,199⁹⁹ As low as **\$55** per month for qualified customers.¹⁰

UPGRADES

- Privacy Screen for \$79.99
- Sony VAIO® Standard Lithium Ion Battery⁶ for \$299.99
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All of the above plus these features:

PCG-TR3AP2

- Microsoft® Windows® XP Professional
- 1GB (512MBx2) RAM



**Elegant Mobility
Z1 Series**

PCG-Z1WA

Featuring Intel® Centrino™

Mobile Technology

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- Intel® 855 Chipset
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- 60GB² Hard Drive
- 14" SXGA+ TFT display
- 512MB RAM
- Integrated CD-RW/DVD Combo Drive⁴
- Amazing battery life up to 6.5 hours⁶
- Integrated Bluetooth® Wireless Technology⁷
- Stylish and sophisticated design in a 4.7 lb. light⁵ and 0.9–1.5" thin body
- 1-Year Limited Warranty³



\$2,299⁹⁹ After \$100 mail-in rebate. Rebate offer expires August 31, 2004. See www.sonymstyle.com/coupon/terms and conditions.
\$2,199⁹⁹ As low as **\$58** per month for qualified customers.¹⁰

UPGRADES

- Sony VAIO® Port Replicator for \$199.99
- Sony VAIO® Double-Capacity Lithium Ion Battery⁶ for \$499.99

All of the above plus these features:

PCG-Z1WAMP2

- Microsoft® Windows® XP Pro Edition
- 1GB (512MBx2) RAM
- Includes Double-Capacity Lithium Ion Battery for up to 13 hours⁶ of battery life



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- 256MB RAM
- Integrated CD-RW/DVD Combo Drive⁴
- Only 4.39 lb. light⁵ and 1.32–1.38" thin
- 1-Year Limited Warranty³

\$1,399⁹⁹ As low as **\$35** per month for qualified customers.¹⁰

UPGRADES

- Upgrade to a 60GB² Hard Drive for \$100
- Sony VAIO® Double-Capacity Lithium Ion Battery⁶ for \$200
- Integrated Wireless LAN 802.11b/g¹⁶ for \$50

All of the above plus these features:

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- Intel® Pentium® M Processor 1.4 GHz¹
- Microsoft® Windows® XP Professional
- Wireless-enabled 802.11b/g¹⁶
- 60GB² Hard Drive
- 12.1" XGA TFT display
- 512MB (256MBx2) RAM



**Desktop Replacement
GRT Series**

Build-to-Order PCG-GRT250

- Intel® Pentium® 4 Processor 2.66GHz¹
- Microsoft® Windows® XP Home Edition
- 40GB² Hard Drive
- 15" XGA TFT display
- 256MB RAM
- CD-RW/DVD Combo Drive⁴
- nVIDIA® GeForce4™ 420 Go 32MB Video DDR SDRAM
- 1-Year Limited Warranty³

\$1,349⁹⁹ As low as **\$34** per month for qualified customers.¹⁰

UPGRADES

- Upgrade to a 60GB² Hard Drive for \$100
- Integrated Wireless LAN 802.11b/g¹⁶ for \$50

All of the above plus these features:

Build-to-Order PCG-GRT250

- Mobile Intel® Pentium® 4 Processor 2.2GHz¹
- Microsoft® Windows® XP Home Edition
- 512MB RAM

\$2,499⁹⁹ As low as **\$63** per month for qualified customers.¹⁰

UPGRADES

- Sony VAIO® Double-Capacity Lithium Ion Battery⁶ for \$349.99
- Sony VAIO® USB Adapter with Bluetooth® Wireless Technology⁷ for \$99.99
- Additional Sony VAIO® AC Adapter for \$99.99

\$2,799⁹⁹ As low as **\$70** per month for qualified customers.¹⁰

UPGRADES

- Additional Sony VAIO® AC Adapter for \$99.99
- Sony VAIO® 802.11g¹⁶ Wireless LAN Router Access Point for \$199.99

\$2,079⁹⁹ As low as **\$52** per month for qualified customers.¹⁰

UPGRADES

- Upgrade to 80GB² Hard Drive for \$200
- Sony VAIO® Double-Capacity Lithium Ion Battery⁶ for \$499.99

\$1,599⁹⁹ As low as **\$40** per month for qualified customers.¹⁰

UPGRADES

- Sony VAIO® Port Replicator for \$199.99
- Upgrade to a DVD±RW drive for \$200

Financing and Warranty Information Take advantage of these added choices and benefits that make owning a Sony so worthwhile. Sony Financing offers online application, low monthly payments and a quick credit decision. You can also apply for a revolving line of credit good for use at www.sonymstyle.com, www.imagestation.com and any Sony Style Real World retail store. For warranty and service information, plus FAQs, Sony Product Service and Support is the source.

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Sony recommends Microsoft® Windows® XP Professional for Mobile Computing.



Desktop Replacement GRT Series

Build-to-Order PCG-GRT390Z

- Intel® Celeron® Processor 2.2GHz¹
- Microsoft® Windows® XP Home Edition
- 40GB² Hard Drive
- 16.1" SXGA TFT with XBRITE™ Technology
- 256MB DDR SDRAM
- CD-RW/DVD Combo Drive⁴
- nVIDIA® GeForce™ FX Go5600
- 64MB video DDR SGRAM
- 1-Year Limited Warranty³

\$1,799⁹⁹ As low as **\$45** per month for qualified customers.¹

UPGRADES

- Upgrade to a 60GB² Hard Drive for \$100
- Integrated Wireless LAN 802.11b/g¹⁶ for \$50
- Upgrade to a DVD±RW drive for \$200

All of the above plus these features:

Build-to-Order PCG-GRT390Z

- Mobile Intel® Pentium® 4 Processor 3.06GHz¹
- Microsoft® Windows® XP Professional
- 60GB² Hard Drive
- 16.1" UXGA TFT with XBRITE™ Technology
- 512MB (512MBx1) RAM
- DVD±RW Drive⁴

\$3,019⁹⁹ As low as **\$76** per month for qualified customers.¹

UPGRADES

- Upgrade to an 80GB² Hard Drive for \$90
- Sony VAIO® Standard Lithium Ion Battery⁶ for \$249.99



Essential Computing K Series

PCG-K15

- Intel® Pentium® 4 Processor 2.80GHz¹
- Microsoft® Windows® XP Home Edition
- 60GB² Hard Drive
- 15" XGA TFT with XBRITE™ Technology
- 512MB RAM
- DVD±RW/CD-RW Drive⁴
- 1-Year Limited Warranty³

\$1,699⁹⁹ As low as **\$43** per month for qualified customers.¹

UPGRADES

- Sony VAIO® Standard Lithium Ion Battery⁶ for \$199.99
- Sony VAIO® USB Adapter with Bluetooth® Wireless Technology⁷ for \$99.99

All of the above plus these features:

PCG-K17

- Mobile Intel® Pentium® 4 Processor 3.06GHz¹
- Microsoft® Windows® XP Home Edition
- 80GB² Hard Drive
- DVD±RW/CD-RW Drive⁴
- Exclusive Click to DVD™ software for easy DVD creation

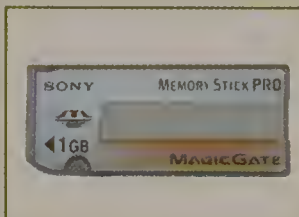
\$1,899⁹⁹ As low as **\$48** per month for qualified customers.¹

UPGRADES

- Sony VAIO® AC Adapter for \$99
- Sony VAIO® Standard Lithium Ion Battery⁶ for \$199.99
- Compact and Lightweight Portable 60GB² External Hard Drive for \$349

Freedom Is Everywhere

With Sony VAIO® notebook PCs and these simple and elegant devices, you can stay connected and organized while on the go. Multiple wireless technology support—802.11a/b/g and Bluetooth®—means that you can exchange more information with more compatible devices in more places, for unmatched freedom.



MSX-1G Memory Stick PRO™ Media

- 1GB of storage (940MB usable)
- Designed for newer high-end devices with theoretical file transfer speeds up to 160Mbps

\$499⁹⁹ As low as **\$13** per month for qualified customers.¹

Sony's Memory Stick® media is designed to easily store, transfer and share photos, music, presentations and more.



PCGA-BA1/A VAIO® USB Bluetooth® Adapter

- Includes BlueSpace NE utility software and Network Smart Capture software

\$99⁹⁹

Connect wirelessly to other Bluetooth®-enabled devices such as PDAs, cell phones, keyboards and more. Fewer cables on your desk means more freedom and convenience.



PCWA-AR800 802.11a/b/g Wireless LAN Router Access Point

- Up to 16 users can access one access point
- Compatible with 802.11a, 802.11b, and 802.11g

\$349⁹⁹ After \$50 mail-in rebate. Rebate offer expires June 30, 2004.¹¹ See www.sonymstyle.com for coupon terms and conditions.
\$299⁹⁹ As low as **\$9** per month for qualified customers.¹⁰

Stylish and compact design with the ability to access the Internet with a wireless signal.¹⁰



PEG-TJ37 CLIE® Handheld

- Integrated Wireless LAN (802.11b)¹⁶
- 310,000 pixel digital camera with 2X digital zoom
- Built-in MP3 audio player¹⁵

\$299⁹⁹ As low as **\$8** per month for qualified customers.¹

Sony CLIE® handhelds provide everything you need to stay organized, entertained and connected.



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Sony recommends Microsoft® Windows® XP Media Center Edition.



Performance RZ Series

Build-to-Order PCV-RZ50C

- Intel® Pentium® 4 Processor with HT Technology at 2.60GHz¹
- Microsoft® Windows® XP Home Edition
- 80GB² Hard Drive (7200 rpm)
- 512MB DDR at 400MHz
- DVD±RW Drive⁴
- 128MB nVIDIA® GeForce™ FX5200 Graphics Card
- Sony VAIO® Creation Suite PLUS software package
- Stereo speaker system with subwoofer and Sound Blaster® Audigy™ Sound Card
- Multimedia Card Reader
- 1-Year Limited Warranty³

\$1,217⁴⁹ As low as **\$31** per month for qualified customers.¹⁰

UPGRADES

- Upgrade to a 160GB² Hard Drive for \$50
- 3-Year Limited Warranty³ for \$199
- Add the SDM-HS73/L 17" Flat Panel Display for \$499.99

All of the above plus these features:

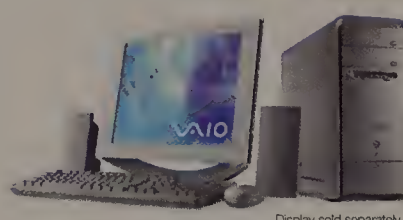
Build-to-Order PCV-RZ50CG

- Microsoft® Windows® XP Media Center Edition
- Creative® Inspire™ T5400 speaker system with Sound Blaster® Audigy™ Sound Card
- 128MB ATI® RADEON™ 9600XT Graphics Card
- 120GB² Hard Drive (7200 rpm)

\$1,446⁴⁹ As low as **\$37** per month for qualified customers.¹⁰

UPGRADES

- Upgrade to 1GB DDR for \$90
- 3-Year Limited Warranty for \$199³
- Add the SDM-HS73/L 17" Flat Panel Display for \$499.99



Affordability RS Series

Build-to-Order PCV-RS500C

- Intel® Celeron® Processor at 2.4GHz¹
- Microsoft® Windows® XP Home Edition
- 80GB² Hard Drive (7200 rpm)
- 256MB DDR at 333MHz
- DVD-ROM and CD-RW Drives⁴
- 128MB ATI® RADEON™ 9200 Graphics Card
- Stereo speakers
- Sony VAIO® Creation Suite Standard software package
- 1-Year Limited Warranty³

\$699⁹⁹ As low as **\$18** per month for qualified customers.¹⁰

UPGRADES

- Upgrade to a 160GB² Hard Drive for \$50
- 3-Year Limited Warranty³ for \$199
- Add the SDM-HS73/L 17" Flat Panel Display for \$499.99

All of the above plus these features:

Build-to-Order PCV-RS500CG

- Intel® Pentium® 4 Processor with HT Technology at 2.80GHz¹
- Microsoft® Windows® XP Home Edition
- 120GB² Hard Drive (7200 rpm)
- 512MB DDR at 400MHz
- DVD±RW and DVD-ROM Drives⁴
- Multimedia Card Reader
- Convert analog video to DVD with the Personal Video Recorder powered by Giga Pocket® Recorder

\$1,206⁴⁹ As low as **\$31** per month for qualified customers.¹⁰

UPGRADES

- Upgrade to 1GB DDR for \$90
- 3-Year Limited Warranty for \$199³
- Add the SDM-HS73/L 17" Flat Panel Display for \$499.99

PCV-RS520

- Intel® Pentium® 4 Processor with HT Technology at 3.0GHz¹
- Microsoft® Windows® XP Home Edition
- 160GB² Hard Drive (7200 rpm)
- 512MB DDR at 400MHz
- DVD±RW and DVD-ROM Drives⁴
- 128MB ATI® RADEON™ 9200 Graphics Card
- Stereo speakers
- Sony VAIO® Creation Suite Standard software package
- 1-Year Limited Warranty³

\$1,049⁹⁹ After \$100 mail-in rebate. Rebate offer expires June 30, 2004. See www.sonymstyle.com for coupon/terms and conditions.
\$949⁹⁹ As low as **\$27** per month for qualified customers.¹⁰

UPGRADES

- Add the SDM-HS73P/B 17" Flat Panel Display for ~~\$699.99~~ \$559.99 (after \$50 mail-in rebate)

Rebate offer expires June 30, 2004. See www.sonymstyle.com for coupon/terms and conditions.

All of the above plus these features:

PCV-RS530G

- Intel® Pentium® 4 Processor with HT Technology at 3.2GHz¹
- Microsoft® Windows® XP Home Edition
- Convert VHS to DVD with Giga Pocket® Personal Video Recorder
- Multimedia Card Reader

\$1,399⁹⁹ After \$100 mail-in rebate. Rebate offer expires May 31, 2004. See www.sonymstyle.com for coupon/terms and conditions.
\$1,299⁹⁹ As low as **\$35** per month for qualified customers.¹⁰

UPGRADES

- Add the SDM-HS73/L 17" Flat Panel Display for \$499.99

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ISP service fees apply. 8. Memory Stick PRO and Memory Stick PRO Duo media features vary and are dependent on the host hardware. 10. On your Sony Financial Services Card, subject to credit approval. A minimum purchase of \$299.99 is required. This is a same-as-cash promotion. If balance on these purchases is paid in full before the expiration of the promotional period indicated on your billing statement and your Account is kept current, accrued Finance Charges will not be imposed on these purchases. If balance on these purchases is not paid in full, Finance Charges will be assessed from the purchase date at the Standard Rate APR of 21.99%. For Accounts not kept current, the Default Rate of 24.99% APR will be applied to all balances on your Account. Minimum monthly payments are required. The minimum monthly payment presented is based on the product and purchase price shown. The minimum monthly payment is 2.5% of the "New Balance" or \$10, whichever is greater. The number of months you will pay and the amount of your total minimum monthly payment will depend on additional purchases and your Account balances. Minimum Finance Charge \$2.00. Certain rules apply to the allocation of payments and Finance Charges on your promotional purchase if you make more than one purchase on your Sony Card. Call 1-888-367-4310 or review your cardholder agreement for information. 11. Purchase must be made by 5/31/04. For rebate mail-in coupon and Terms and Conditions, please visit www.sonymstyle.com. 16. Requires compatible 802.11b or 802.11g wireless.



Sony recommends Microsoft® Windows® XP.

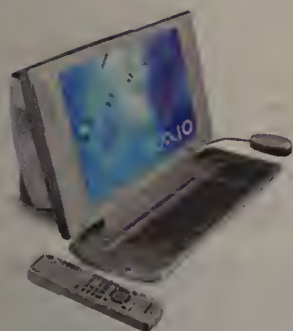


**All-in-One
V Series**

PCV-V200G

- Intel® Pentium® 4 Processor 2.80GHz¹
- Microsoft® Windows® XP Home Edition
- 120GB² Hard Drive
- 512MB DDR at 333MHz
- DVD-RW Drive⁴
- 15" LCD display
- Wireless keyboard, wireless mouse and remote control
- Built-in stereo speakers
- Convert VHS to DVD with Giga Pocket® Personal Video Recorder
- FREE wireless-b LAN PC card¹⁷ when purchased from www.sonymstyle.com. While supplies last.²²
- 1-Year Limited Warranty³

\$1,699⁹⁹ As low as **\$43** per month for qualified customers.¹⁰



**All-in-One
W Series**

PCV-W600G

- Intel® Pentium® 4 Processor 2.80GHz¹
- Microsoft® Windows® XP Home Edition
- 160GB² Hard Drive (7200 rpm)
- 512MB DDR at 333MHz
- DVD-RW Drive⁴
- Built-in 17.5" widescreen LCD display
- Memory Stick® Media Slot
- Built-in stereo speakers featuring SRS™ WOW™ technology
- Convert VHS to DVD with Giga Pocket® Personal Video Recorder
- FREE wireless-b LAN PC card¹⁷ when purchased from www.sonymstyle.com. While supplies last.²²
- 1-Year Limited Warranty³

\$1,999⁹⁹ As low as **\$50** per month for qualified customers.¹⁰



**Flat Panel LCD
Display**

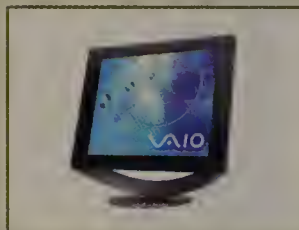
SDM-S204/B

- 20.1" UXGA 1600x1200 high-resolution LCD panel
- Super-thin bezel design
- ErgoBright™ technology for optimal image performance
- Digital and analog inputs

\$1,099⁹⁹ As low as **\$28** per month for qualified customers.¹⁰

Entertaining Combinations

Surround yourself with more entertaining possibilities. Sony VAIO® computers are designed to look beautiful, and engineered to work beautifully with other Sony products—creating a network of compatible devices that makes it easy for you to enjoy your music, photos and movies.



SDM-HS73P/B 17" Flat Panel LCD Display

- TFT Active Matrix with XBRITE™
- 17" viewable image size

\$609⁹⁹
\$559⁹⁹

After \$50 mail-in rebate. Rebate offer expires June 30, 2004.¹¹ See www.sonymstyle.com for coupon/terms and conditions. As low as **\$16** per month for qualified customers.¹⁰

Combines XBRITE™ technology—Sony's new standard in picture quality—with brilliant images, sharp text and eye-dazzling colors. Innovative floating frame design complements any room in your home.

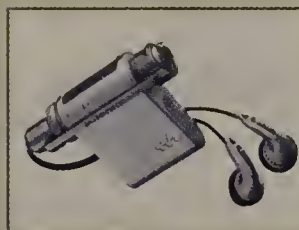


DCR-PC109 MiniDV Handycam® Camcorder

- 1.0 Megapixel Advanced HAD™ CCD imager
- Professional-quality Carl Zeiss® Vario-Sonnar T* lens
- 10X optical/120X precision digital zoom
- Handycam® Station included (pictured)

\$899⁹⁹ As low as **\$23** per month for qualified customers.¹⁰

Compact and feature-rich, it's the perfect camcorder for people who demand quality and convenience.



NW-MS90D Network Walkman® Digital Music Player

- 512MB built-in memory with MagicGate™ Memory Stick Duo™ expansion slot
- USB cradle for easy PC connection and recharging
- Internal battery provides up to 33 hours of continuous playback⁶

\$399⁹⁵ As low as **\$10** per month for qualified customers.¹⁰

This tiny little device is packed with memory! Small enough to carry in your pocket or purse, and comes equipped with 512MB of embedded memory, allowing you to store up to 340 songs.



MSX-M256A Memory Stick PRO Duo™ Media⁸

- 256MB of storage (220MB usable)
- Compatible with standard-size Memory Stick® media using included adapter
- Includes MagicGate™ copyright protection technology

\$114⁹⁹

Sony's Memory Stick PRO Duo™ media is designed to easily store, transfer and share photos, music, presentations and more. Ideal for use in small digital devices.



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access point, some of which may require a fee and/or ISP. 17 Requires compatible 802.11b wireless access point, some of which may require a fee and/or ISP. This wireless LAN product has been designed to permit legal operation worldwide in regions in which it is approved. Operation on channels 12–14 is not permitted in all regulatory regions of the world. The wireless LAN feature is limited to operate on channels 1–11 and will not support channels 12, 13 and 14. This product has been tested and certified to be interoperable by the Wireless Ethernet Compatibility Alliance and is authorized to carry the Wi-Fi logo. 18. Limited time offer; visit www.ImageStation.com for details. Charges apply for certain products and services. Sony may change or cancel ImageStation.com service at any time without notice. PC and ISP required. 22. Offer valid with purchase of PCV-V200G direct from www.sonymstyle.com. While supplies last. 24. Purchase must be made by 6/30/04. For rebate mail-in coupon and Terms and Conditions, please visit www.sonymstyle.com. 25. MP3 music playback requires Memory Stick media. Sold separately. 27. Purchase must be made by 8/31/04. For rebate mail-in coupon and Terms and Conditions, please visit www.sonymstyle.com. 29. After \$49 mail-in rebate. Printer model may vary. Taxes and shipping charges may apply. Offer valid only when purchased from www.sonymstyle.com. Offer expires 6/30/04. For rebate mail-in coupon and Terms and Conditions, please visit www.sonymstyle.com. 30. Requires an ISP, which may require a fee.



Sony VAIO® W600G Series PCs with Intel® Processors. You pick the room and this all-in-one entertainment PC is sure to be the center of attention with its sleek good looks and sophisticated design. Watch and record your favorite TV shows, capture and edit your photos, even add a music track.

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FileMaker 7 Beefs Up

DATABASE MANAGEMENT

FILEMAKER PRO has long been the database of choice for people who don't need complicated database capabilities. However, with the release of **FileMaker Pro 7**, this popular workhorse gains increased muscle for higher-end apps. Version 7 will easily work for a great majority of database applications, including programs with browser-based interfaces, Godzilla-size content-management programs, and

complex data files with many tables that each define relationships. Upgrade to version 7 if you need the beef.

Using its Instant Web Publishing tool, nonprogrammers have a greater ability to share databases that coworkers may add to or change. Version 7 also sports 70 FileMaker script steps that work in the Web environment, including the multiple ways of looking at data (Form, List, and Table) that made earlier FileMaker versions so practical.

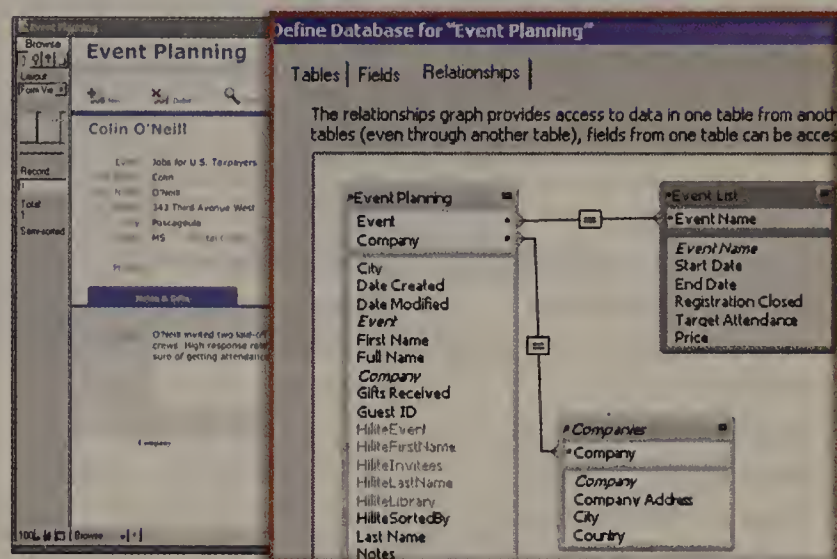
As for graphics handling, FileMaker Pro is now able to store container fields as large as 2GB, holding any kind of binary file, including video, audio, and Adobe Acrobat files. Combine this with what the program calls "portals"—

the ability to use relationships to display information from other tables within a form or table—and you can quickly home-brew a capable content-management tool that lets you create pages resembling photo contact sheets. These can hold, for instance, video clips that demonstrate new products. FileMaker Pro 7 also enjoys

8-terabyte file storage limits.

Version 7 retools the way FileMaker handles complex databases, supporting multiple tables per database file, and adding stronger relationship-designation tools that will be familiar to users of Microsoft Access but that are easier to work with.

—Jeff Angus



FILEMAKER 7 now stores multiple tables and uses a clear graphical model (right) to define and show you the tables' relationships.

FileMaker Pro 7

FileMaker

★★★★★

Still a great app for database newcomers; worthwhile upgrade for more-complex projects.

List: \$299, upgrade \$149

find.pcworld.com/41876

Pixa's Combo Projector and DVD Player

HOME THEATER

IF YOU'RE looking for a good-quality projector that can serve as a one-stop media center for DVDs, cable TV, HDTV, video games, PCs, and digital photos, the Pixa **DHT-100** may be just what you need. Designed to be an all-in-one home theater projector, the 8.4-pound device comes with a detach-

able DVD player and a 128-channel TV tuner, plus a built-in media viewer that supports a variety of memory card formats for displaying digital camera or camcorder images.

I was generally impressed with a preproduction DHT-100's versatility and overall ease of operation in displaying a wide variety of content. The

unit's modular DVD player, which features progressive-scan and Dolby Digital 5.1-channel audio output, connects to the bottom of the projector (the latter is insulated to ensure that overheating discs isn't a problem).

A multifunction remote controls the projector, DVD player, media player, and TV tuner. I found the remote rather sluggish in its response time when making DVD movie menu selections and performing a few other functions, but Pixa says the final version will be fine-tuned.

The DHT-100 also plays audio CDs, MPEG videos, and CD photo albums in addition to DVD movies. However,

Pixa doesn't intend the DVD unit to operate when it is separated from the projector.

The projector's media player did a fine job displaying digital photos from a CompactFlash card, and the TV tuner also functioned flawlessly. In all my tests, the projector was suitably quiet and easily bright enough (1300 ANSI lumens) to display images under daylight conditions in a living room.

—Richard Jantz ■



PIXA DHT-100 with detachable DVD player.

DHT-100

Pixa

Preproduction unit, not rated Unique all-in-one projector is a great choice for any home entertainment center that also needs a DVD player.

List: \$1999

find.pcworld.com/41878

Burn DVDs by the Dozen

DISC DUPLICATION

DO YOU REGULARLY need to produce small runs of colorful-looking CDs or DVDs for your staff or clients? If so, Primera Technology's **Bravo II Disc Publisher** combination disc-duplication and inkjet printing system is handy indeed. Using it eliminates the need to travel to a dupe shop, or to endure tedious hand duplication and printing. You create your master CD/DVD

Bravo II Disc Publisher

Primera Technology

★★★★☆

Handy but somewhat expensive small-office disc duplicator skimps on software features.

List: CD/DVD version \$2695

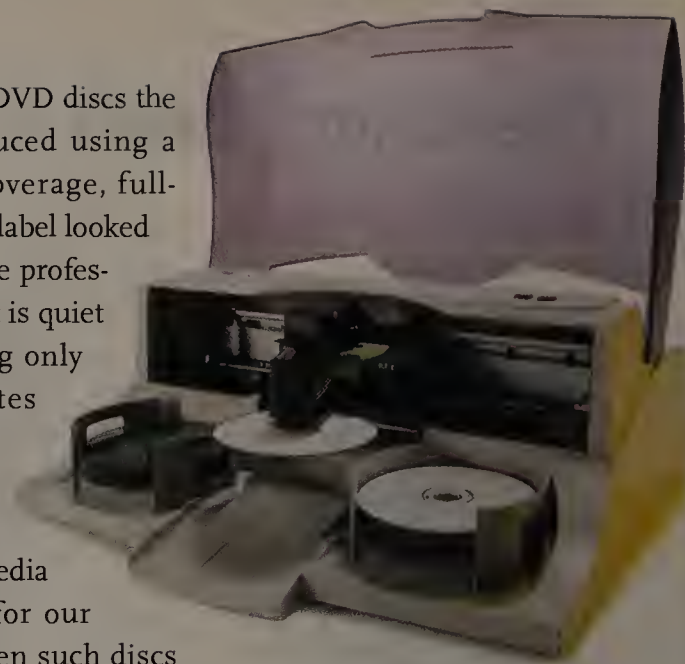
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and the disc art, and then the Bravo II Disc Publisher does the rest to produce up to 50 printed discs at a time.

The Windows version of Bravo II that I tested (Mac software is also available) ships with MicroVision Development's SureThing Disc Labeler LE and Sonic's PrimoDVD 2 for mastering. The programs are effective, but lacking in advanced features. PrimoDVD imports SureThing labels and has dedicated features for the Bravo II's robotics, and will burn a DVD movie from an image file or as a data job if formatted properly. SureThing Disc Labeler LE is a limited version that does not create jewel-case inserts and offers very little artwork.

The CD and DVD discs the Bravo II produced using a 100-percent-coverage, full-spectrum color label looked nice, if not quite professional. The unit is quiet and fast, taking only about 7 minutes per CD and 19 minutes per 4X DVD. No printable 8X media was available for our review; but when such discs are out, expect approximately 11 to 12 minutes per DVD.

Alas, the Bravo II is a pricey convenience. The initial cost—\$2195 for a 52X CD-only model or \$2695 for the 8X/8X DVD±R/RW, 24X CD-R shipping model that I looked at—is only the beginning. There are also ink and disc expenses: approximately \$1 per CD and \$3 per DVD, depending on



PRIMERA'S Bravo II Disc Publisher burns and prints discs.

the ink coverage and the quality and speed rating of the discs. People who need bigger lots than 50 at one time can get a much better per-unit rate for a 1000-disc run from a duplication house, albeit a little less conveniently.

—Jon Jacobi

Video Converter Preserves Memories

VIDEO TRANSFER

A FUNNY THING happened on my way to reviewing Plector's **ConvertX PX-M402U** video capture device: I learned that the only record I have of my 16-year-old son's third birthday party is worth far more to me than the \$159 this handy little box costs. I was playing the precious VHS home movie when the screen filled with the moiré-style interference often associated with a tape

gone bad. Luckily, the tape was fine—our TV had bitten the dust. Using a shipping PX-M402U, I was able to convert the movie to digital video and then save it by writing it to optical media with my own DVD burners.

The PX-M402U connects to a DVD player, VCR, TV, or analog camcorder via its RCA composite audio/video ports or its S-Video inputs. The WinDVD Creator software

included with the package lets you select source and output from drop-down lists; I used the highest-quality MPEG-2 settings for my conversion. You can easily capture video; edit it; add titles, transitions, effects, and music; and build menus. I burned my movie on my DVD-R recorder and then made a DVD+R copy with another burner. If you don't already have a DVD burner, you may want to look at devices, such as HP's \$250 DVD Movie Writer DC3000, that both convert and burn.

What impressed me most about using the ConvertX was that I could see no difference between the digital copy it made and the tape original.

The PX-M402U's capture

formats include MPEG-1, MPEG-2, MPEG-4, and DivX. WinDVD Creator allows you to burn your final video to DVD, mini DVD, or Video-CD, or to convert your video over to AVI, MPEG-1, MPEG-2, MPEG-4, ASF, WMV, or DivX movie file format.

Having found it so easy to ensure the survival of one precious tape, I plan to gather the rest of our home movies and convert them all. Bringing back the memories is worth the modest investment.

—Rex Farrance ■



PLEXTOR
ConvertX PX-M402U.

ConvertX PX-M402U

Plector

★★★★☆

Great device easily converts analog video into superb digital copies in a variety of formats.

List: \$159

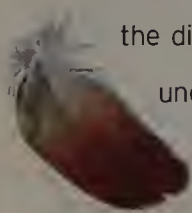
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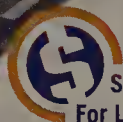
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TOSHIBA

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SONY

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- 60GB Hard Drive • WinXP Home



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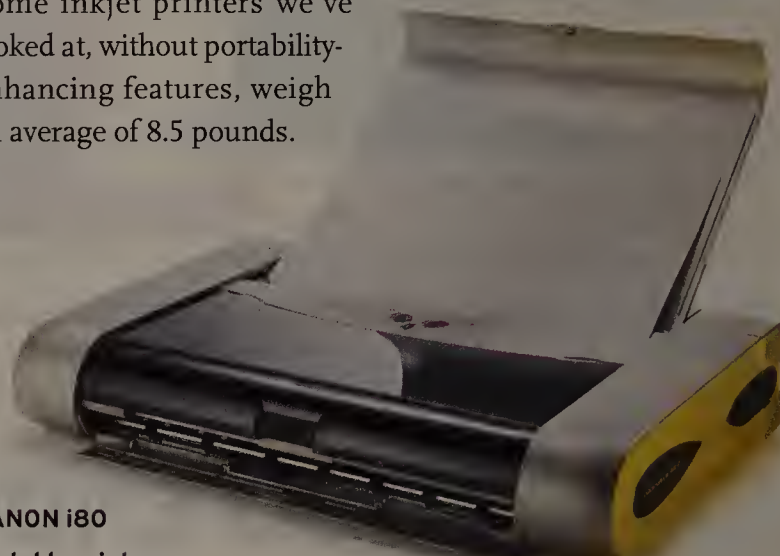
A Pricey Portable Printer

PRINTER

CANON's **i80 Color Bubble Jet Printer** is a versatile photo and text printer with high-quality, speedy output. This 12.4-by-6.9-by-2-inch device is billed as portable, but it weighs in at almost 5 pounds (including an optional battery pack you are sure to need), which is not insignificant. However, recent home inkjet printers we've looked at, without portability-enhancing features, weigh an average of 8.5 pounds.

I inserted; the results had no smears or bleeds, even on low-end bond. A full page of black text printed out in 10 seconds in my tests.

Using the included Canon software, I achieved excellent results for photos printed on 20-pound bond and outstanding quality on the company's custom Photo Paper Pro pa-



CANON i80
portable printer.

The i80 supplies a clutch of printer connections, including one for a USB 2.0 cable, plus a wireless printing capability (via a built-in infrared port or an optional \$80 Bluetooth module). The device can use conventional AC power, and it also works with a \$140 battery/charger kit or a \$90 car adapter. If you purchase all the options, this basic \$249 printer ultimately costs an extremely pricey \$559. Is it worth it? Only if you truly need printing on the go.

The printer's top cover, when opened, doubles as a paper stand that easily handles 12 sheets of 20-pound bond and single sheets of Canon-optimized photo paper. Black-only and color output looked remarkably crisp on any quality of paper that

per. A high-resolution photograph took a minute to print.

Both wireless infrared and Bluetooth-module printing from my Palm Tungsten C were a snap. The printer can also print without a PC from any PictBridge-compatible camera or camcorder. The device's lithium ion battery charged in 2 hours and powered through five 8-by-11.5 photos and a dozen text-only pages with no change noted on the power indicator.

—Michael S. Lasky ■

i80 Color Bubble Jet Printer

Canon

★★★★☆

Expensive portable printer produces high-quality output.

List: \$249 for base unit

find.pcworld.com/41886

Online Surveys Made Easy

SURVEY SOFTWARE

THERE IS NO better way to find out what your customers want from your business than to ask them. Online surveys can go a long way toward obtaining this vital information, but most software products targeted to smaller businesses skimp on features and options, or prove difficult to use.

Not so with Quask's \$899 **FormArtist Professional Edition**. This software lets polling neophytes easily create, deploy, and tabulate surveys, yet it has a suite of powerful features that will appeal to businesses

with moderate survey needs.

You can create a survey from scratch or use templates, which you modify for the questions you need to ask. You place the forms in your

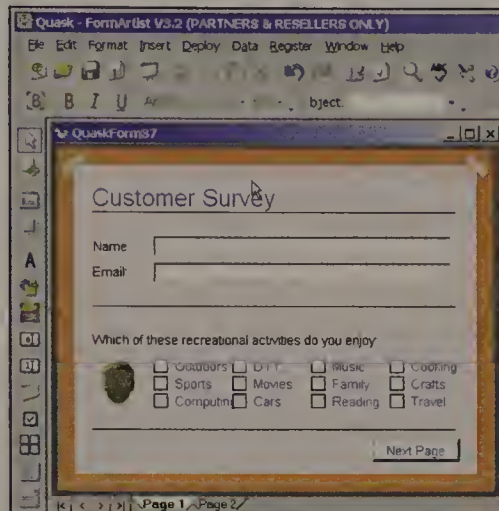
own Web page templates to retain the look and feel of your company's site. The templates make the software simple to use. However, creating a custom form requires more time. FormArtist's help files are adequate, but it took me several hours to build a six-page custom form.

When satisfied, deploy your form to a Web server or try it on Quask's test server. To look at the responses, you "fetch" the data back to the PC where the form was originally created, and then you drop it into customer relationship management software or into a database with Open Data Base Connectivity. Most users will likely want to

have the data exported as an Excel, CSV, HTML, SPSS, or XML file, which this software does with commendable ease.

The software had one very annoying problem: Setting the tabbing sequences correctly on preexisting form pages with text boxes (an address form, for example) was quite hard to figure out. (The company says it will look at this in future versions.)

—Ramon G. McLeod ■



TEMPLATED FORMS make Quask's FormArtist survey software easy to use.

FormArtist Professional Edition

Quask

★★★★☆

Online survey software has extensive templates; its custom forms can be tricky to use.

List: \$899

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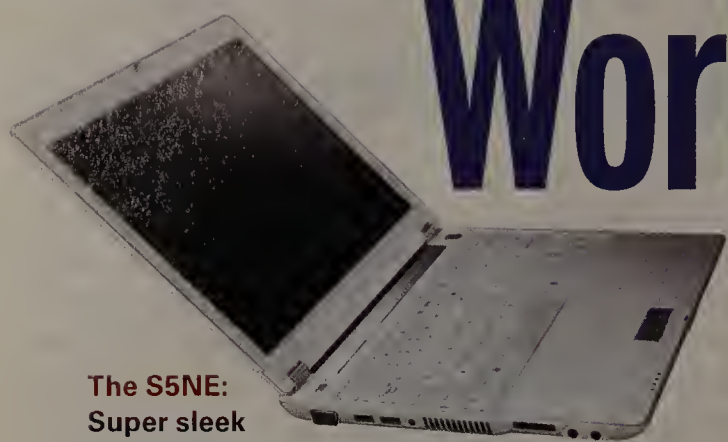
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The S5NE:
Super sleek
mobility from
an ultra lite notebook

World Class Mobility

ASUS
notebooks deliver
cost-effective
functionality,
style and speed

When it comes to buying a notebook computer, buyers need to ask several key questions: "How dependable is the vendor behind this product? What kind of engineering intelligence went into the components? Does it look good and is it a pleasure to use?"

If you answer these questions as a typical buyer, you'll find you have described the integrity and product quality of ASUS (usa.asus.com), a company whose core mission is dedicated to the pursuit of quality, performance, innovation, and service.

ASUS is not just another notebook vendor; rather, it's a company that is directly involved in all aspects of notebook manufacture and sale. For example, ASUS is the largest maker of motherboards and one of the world's top five notebook manufacturers.

ASUS also designs and manufactures many products for top-brand vendors, in addition to its own full line of notebooks, which includes ultraportables, wide-screen multimedia machines, desktop replacements, and rugged mainstream machines.

Style and speed

The spirit of innovation at ASUS is evident in the ASUS S5NE. This is a notebook computer that manages to strike that sought-after balance between sleekness and mobile functionality. The S5NE's elegant, silvery-white exterior gives way to a super-stylish,

translucent white keyboard when you raise the cover.

But don't let the S5NE's great looks or its amazingly light three pounds fool you. This machine incorporates the Ultra Low Voltage Intel Pentium M processor and Intel Centrino Mobile technology. The S5NE also sports an award-winning, slender DVD/CD-RW drive and a wireless mouse—all standard equipment in this reliable notebook.

For those seeking style and sophistication in a wide-screen package, ASUS offers the W1N notebook. Included in the features of this crowd-pleasing computer are the following:

- Elegantly sculptured brushed-metal exterior with dark gray keys and subtle orange LED readout and accents
- Superior ergonomic design
- Multimedia-ready with a 15.4" wide screen with 16 x 10 aspect ratio, surround sound with subwoofer, and a dedicated ATI Mobility Radeon 9600 graphics processor

The exclusive power saving technology of the W1N allows you to control CPU speed to maximize battery performance, extending the notebook's use when unplugged. And super-fast keys allow all your attention to go where it belongs—the screen. The brilliant wide-screen display provides outstanding viewing of work documents as well as videos and games.

Part of the "Built on ASUS" product

The W1N: Style
and sophistication
in a wide-screen
package



line of "white box" notebooks—machines sold to integrators, who then custom-configure them for resale—the ASUS M6N is a blend of flexibility, style, and high performance. With a 15.4" wide screen and a smart black 5.6-lb. carbon-fiber chassis, the M6N features a convertible modular design for enhanced portability. The M6N is as functional in the office as it is in the coffee shop between meetings or in the living room after hours.

For buyers seeking a desktop replacement, ASUS offers its L5G series of notebooks. Rugged and powerful, these machines use desktop processors and powerful dedicated 3D graphics processors. They feature spacious high-resolution 15" screens. The L5G series is ideal for those who require mobility and the performance of a desktop PC. The L5G series targets multimedia content creators, engineers, and LAN party gamers, among others.

To find out more about the exciting technology available from ASUS - a global leader in innovative and stylish notebook solutions - click now on usa.asus.com.



W1



W1
Series

Boom, boom, boom!
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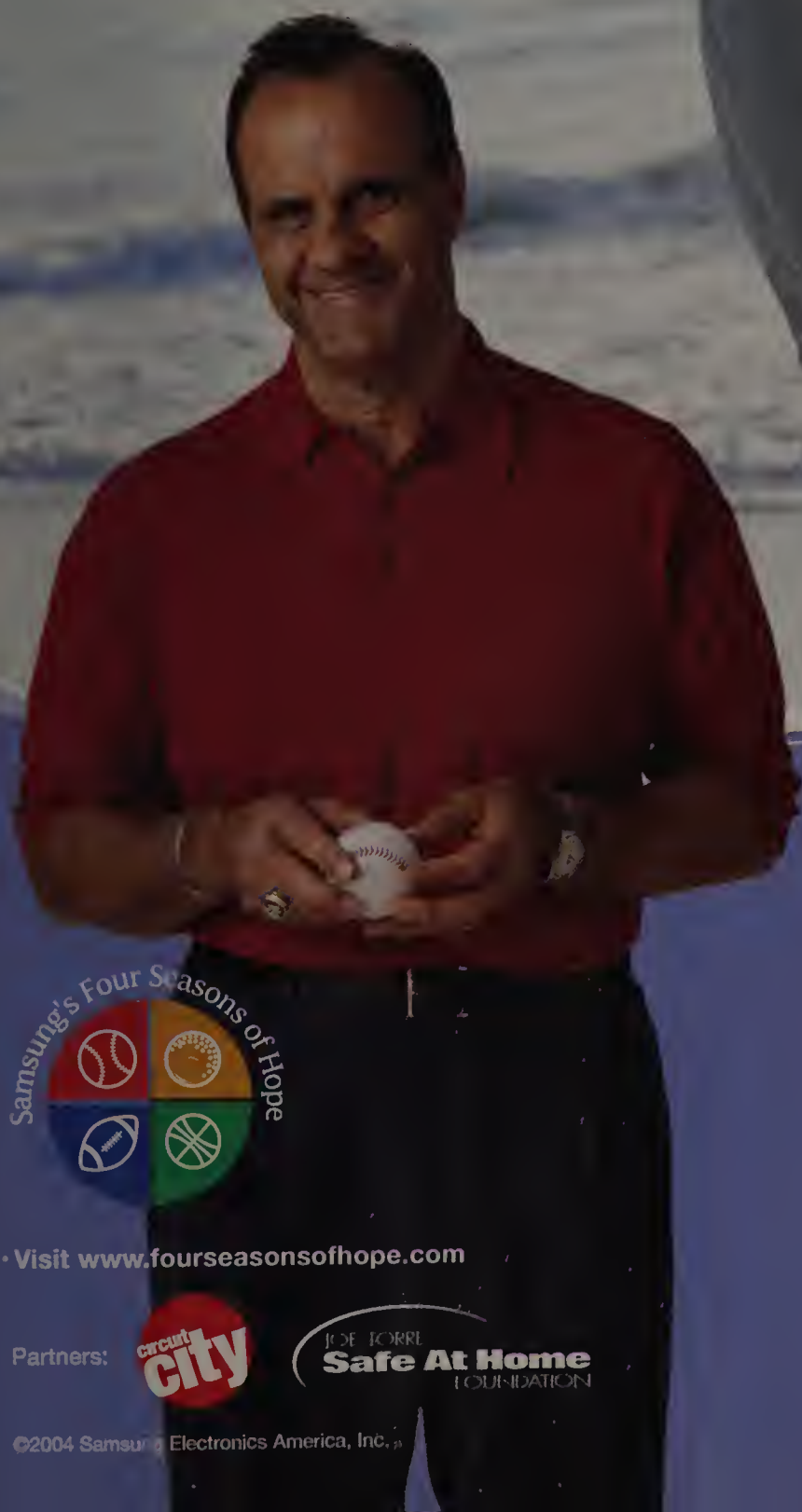
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Enter here to win: www.pcworld.com/survey

Tell us your experiences with PCs and other technology devices—your name will automatically be entered in the prize drawing. To take the survey online, you'll need a copy of the magazine with your subscriber number on the mailing label. The Web site explains the official rules and specifies how to participate in the drawing if you're not a subscriber. You need submit only one entry to qualify, and you can enter through July 1, 2004.

SURVEY DETAILS: No particular answer will impact your chances of winning. We will not sell your personal data or share it with any third parties. The prize drawing is open to all legal U.S. and Canadian residents (except those in Quebec and Puerto Rico), age 18 or older. No purchase or survey participation is required to enter or win the prize drawing.

**Please join Samsung, Circuit City
and Joe Torre to help prevent
domestic violence.**



Samsung's Four Seasons of Hope, Circuit City and Joe Torre have teamed up to make a difference in the community. The Joe Torre Safe At Home Foundation raises funds to support the development and implementation of a comprehensive educational program through awareness campaigns and targeted curricula for youth. The Foundation has raised over 1.7 million dollars and is advancing the cause through partnerships with companies like Samsung and Circuit City. We're proud to support this deserving cause. To find out how you can help, visit www.joetorre.net or contact the Joe Torre Safe At Home Foundation at 212-907-0036. The Four Seasons of Hope. Because no one should ever go without.



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Bigger Threats, Better Defense

We test 16 security tools that aim to foil worms, viruses, spies, and hackers. **By Mary Landesman**

Today's malicious code does not just target your computer—it targets you. Criminals who traffic in stolen credit card numbers and identity information increasingly use viruses and worms to snare victims.

And viruses are only one of many threats. Some spam e-mail messages use so-called phishing schemes to trick recipients into revealing banking or credit card information. Miscreant advertisers use spurious pop-ups that exploit operating system weaknesses to hijack victims' browsers or install spying software.

As security threats have grown to encompass more than viruses, security experts have adopted the term *malware* to describe all malicious code. Combating this stew of invaders requires defense in depth—multiple barriers between the malware and your system. *PC World* evaluated 16 firewalls, virus scanners, spyware removal tools, and security suites to find the best arsenal. (For our review of spam fighters, see “Spam-Proof Your In-Box” on page 87.) ►

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Perimeter Defense: Firewalls

A FIREWALL FORMS THE FIRST line of defense against hackers, worms, spyware, and other evils. *PC World* partnered with German security firm AV-Test to find the best.

Many homes and businesses use routers to share a broadband connection. To gauge the protection such devices provide, we tested two sample models of router and 802.11g wireless access point: Linksys's Wireless-G Broadband Router WRT54G and Microsoft's Wireless-G Base Station MN-700. Routers provide a basic firewall as a by-product of the way they handle Internet traffic. Using Network Address Translation (NAT) and Dynamic Host Control Protocol (DHCP), a router distributes private IP addresses to PCs on the network, thereby hiding them from outside computers, which see only the IP number of the router itself. Routers open ports to the Internet only if you set them to open or if the PCs on the network request data (in retrieving a Web page, for example).

The routers withstood assaults from port-scanning tools, which hackers use to find vulnerable targets. Since no system on the network had requested the data packets, the routers simply dropped them. Both products let us open select ports and assign them to the IP addresses of specific PCs. Known as *port forwarding*, this process lets you run servers for online games or Web sites without exposing other PCs on the network. One nice feature about Microsoft's unit: It enabled WEP encryption by default and generated a key to help protect wireless traffic. (For more on Wi-Fi security, see May's "Beating the Wireless Blues," find.pcworld.com/41796.)

SOFTWARE FIREWALLS WATCH YOUR PC

A ROUTER DEFENDS against outside attacks. But some types of malware—such as worms, Trojan horses, and spyware—work from within. You need a PC-based software firewall to stop them.

A purely permissions-based firewall alerts you when any appli-

cation tries to communicate over the network, and enables you to block it. This will draw your attention to potential malware apps.

As a convenience, the firewalls in Panda Platinum Internet Security and in Symantec Norton Internet Security 2004 automatically granted permission to many Windows applications, but this measure can compromise protection. For example, Panda's provision to allow access for Windows services left open port 135—which the infamous Blaster worm uses to squirm into PCs. Panda fixed this vulnerability after we alerted the company.

Obviously, a security suite should permit its own components

to run. McAfee Internet Security Suite 6, however, did not. Our attempts to send e-mail were thwarted by McAfee Privacy Service alerts reporting that MCSHIELD.EXE and MGHTML.EXE (two components of its own suite) were attempting to access a "guarded file,"—the e-mail client's application.dat file.

WRESTLING WORMS

SYGATE'S Personal Firewall Pro 5.5 and Zone Labs' ZoneAlarm Pro 4.5 neither attacked themselves nor granted carte blanche to other applications. Consequently, they give you great power to monitor your system.

But if you don't have the patience to ponder an alert before clicking 'OK', you may put yourself at greater risk.

Consider the Bagle worm, which hides its identity by injecting itself into the Windows Explorer application. When AV-Test infected a system with this worm, the McAfee, Norton, Sygate, and ZoneAlarm firewalls asked if Windows Explorer could access the Internet. Attentive users might wonder why the app was spontaneously trying to access the Internet, but others might simply click the OK button without considering the implications.

To avoid such problems, you might opt for a port-filtering firewall of the type included in the Windows XP operating system or a port- and packet-filtering firewall like the one in Trend Micro's PC-cillin Internet Security 2004 suite. Packet-filtering firewalls monitor data passing to and from the computer and look for known vulnerabilities or suspicious behavior. For example, they can block attempts to access backdoor ports that e-mail worms may have opened to receive instructions from remote hackers.

Normally, you won't need a firewall to catch a worm or backdoor program; that's the job of an antivirus utility. But antivirus scanners work best when they can compare potential viruses against databases of previously identified viruses. New threats usually go undetected until specific updates can be created, released, and applied—a lapse in coverage that may range from a few hours to a few days, as AV-Test found in a separate, extensive survey of antivirus companies' outbreak response times.

TOOL KIT



BEST DEFENDERS

Software and Hardware Firewall Best Buys

- Trend Micro PC-cillin Internet Security 2004
- Zone Labs ZoneAlarm Pro 4.5

Antivirus Scanner Best Buy

- Trend Micro PC-cillin Internet Security 2004

Anti-Spyware Scanner Best Buys

- Lavasoft Ad-aware 6 Plus
- Spybot Search & Destroy

Spam Filter Best Buy

- Cloudmark SpamNet



COMBO ROUTER/ACCESS POINT and firewall products from Linksys (left) and Microsoft.



For our review, AV-Test challenged the firewalls with common worm attacks. For example, testers installed a program that attempts to mass-mail several hundred copies of itself as an executable attachment. Both the McAfee and the ZoneAlarm firewalls stopped the action by using a throttling feature that warns of attempts to send messages to many recipients at once or to send a single message repeatedly. Panda thwarted the worm with a feature that blocks outgoing e-mail containing executable attachments.

In another test, Panda did not block an attempt by the Bagle worm to open a backdoor port on a system and receive instructions from a remote hacker. The two routers did block the action, and the software firewalls from McAfee, Norton, Sygate, and

and ZoneAlarm provided alerts about the attempt, but they identified Windows Explorer as the application using the port, and could not tell that a worm was piggybacking on Windows Explorer in

order to evade detection. The port-filtering PC-cillin and Windows XP firewalls blocked attempts to access the worm through the port, thereby silently protecting the computer, without requiring users to interpret alerts

as they would have to with the permission-based software firewalls from McAfee, Norton, Sygate, and ZoneAlarm.

In addition to opening backdoor ports, malware may try to expose a PC by disabling security software. Panda, Sygate, and ZoneAlarm Pro resisted such attacks. But invading code shut down the Windows XP firewall and McAfee, Norton, and ►

A FIREWALL MAY PREVENT VIRUS OUTBREAKS.

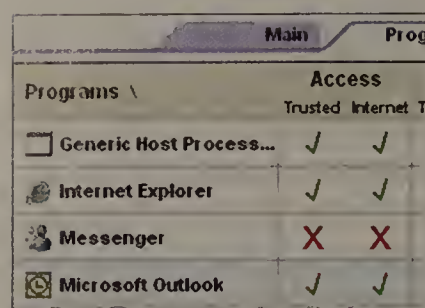
FEATURES COMPARISON

COMBINE SOFTWARE AND HARDWARE FIREWALLS

AMONG SOFTWARE FIREWALLS, ZoneAlarm Pro 4.5 is best for advanced users, but PC-cillin's packet filter is the set-and-forget choice.

SOFTWARE FIREWALL	Street price (3/15/04) ¹	Blocks attempts to shut down/delete firewall	Blocks Bagle worm backdoor/mass-mailing	Ease of use rating	Comments
Microsoft Windows XP, SP1 Internet Firewall find.pcworld.com/41980	Free ²	No/Yes	Yes/No	Very good	Included as part of the Windows XP operating system, but not enabled by default. Its non-permission-based port filtering is a good free choice for people who run Windows XP. ★★☆☆☆
Network Associates McAfee Internet Security Suite 6 find.pcworld.com/41982	\$70	No/No	Yes/Yes	Poor	Bundled firewall offers good protection but conflicted with other components of the suite, resulting in testers' inability to send e-mail. ★★☆☆☆
Panda Platinum Internet Security find.pcworld.com/42002	\$80	Yes/Yes	No/Yes	Fair	Firewall's preconfigured permission list automatically gives access to installed apps and components of the Windows OS, lessening security. Only product to leave a port (number 135) open to our scan tests. Panda later issued a patch. ★★☆☆☆
Sygate Personal Firewall Pro 5.5 find.pcworld.com/42006	\$40 ³	Yes/Yes	Yes/No	Good	High degree of granularity gives experienced users maximum control. Interface can be confusing to less experienced users, but default settings provide a high degree of security. ★★★★★
Symantec Norton Internet Security 2004 find.pcworld.com/42008	\$69	No/No	Yes/No	Fair	Preconfigured permission list automatically grants Internet access to certain programs; though convenient, it lessens the effectiveness of a permission-based firewall. ★★☆☆☆
Best BUY Trend Micro PC-cillin Internet Security 2004 find.pcworld.com/42012	\$50	No/No	Yes ⁴ /No	Very good	Includes privacy controls to prevent sending of sensitive information from the PC; port filtering approach makes it a good choice for novice users. Network worm awareness isolates infected systems. ★★★★★
Best BUY Zone Labs ZoneAlarm Pro 4.5 find.pcworld.com/42019	\$50 ³	Yes/Yes	Yes/Yes	Outstanding	Best-performing program is also easy to use, with simple configuration and meaningful alert messages. A free version lacks mass-mailer protection and extras such as privacy-guarding features. ★★★★★
ROUTER FIREWALL					
Linksys Wireless-G Broadband Router WRT54G find.pcworld.com/42030	\$90	Yes/Not applicable ⁵	Yes/No	Very good	Management console is slow to load, but very easy to navigate for configuring the firewall and other features. Wireless encryption is disabled by default. ★★★★★
Microsoft Wireless-G Base Station MN-700 find.pcworld.com/42032	\$90	Yes/Not applicable ⁵	Yes/No	Outstanding	Provides a responsive, easy-to-use management console. Intuitive setup enabled WEP encryption by default and automatically generates encryption key. ★★★★★

Performance testing by AV-Test GmbH (www.av-test.org) for PC World. **FOOTNOTES:** ¹ The McAfee, Norton, Panda, and PC-cillin firewalls are part of suites that include antivirus scanners and other utilities. Prices are for the entire suites. ² Part of the Windows XP Home and Professional operating systems. ³ A free basic version is available. ⁴ Firewall does not prevent port from opening but does block outside attempts to access the worm's backdoor component. ⁵ Firewall runs on the router, not on the PC.



FIREWALLS LIKE ZoneAlarm track applications running on your PC.

worms spread through shared drives, by e-mail, or via file-sharing applications such as Kazaa and Gnutella. Software firewalls are also a must for laptops that leave the protection of a home or office router and connect to public Wi-Fi hotspots or hotel networks.

We liked Sygate's performance and granular configuration options but found the program confusing. Consider this Sygate alert: "Internet Explorer (IEXPLORE.EXE) is trying to connect to www.microsoft.com (207.46.134.221) using remote port 80 (HTTP - World Wide Web)." ZoneAlarm asked, "Do you want to allow Internet Explorer to access the Internet?" ZoneAlarm Pro 4.5's usability and performance earned it our Best Buy. If you don't have the patience to configure a permission-based firewall, PC-cillin's port-filtering firewall is a worthy alternative Best Buy.

Trend Micro suites, and deleted the program files of the latter three.

COMBINE FORCES

ROUTERS LIKE the Linksys and Microsoft models fend off externally launched attacks, while software firewalls protect systems from

Inside Coverage: Antivirus Apps

THOUGH FIREWALLS DO block some port-probing network worms and may hinder some mass-mailers, you need an antivirus scanner to stop many threats that arrive via e-mail or file downloads. And only an antivirus scanner can remove the infections. To find the best scanners, we first reviewed a fresh round of testing that AV-Test had performed on 31 antivirus products. We chose six of them for a closer look: the stand-alone programs Grisoft AVG Anti-Virus Professional and Eset NOD32, plus the scanners in the four security suites from our firewall tests.

Each product met our minimum requirement of catching all "in the wild" malware. Such viruses have been sighted by at least two members of the WildList Organization (www.wildlist.org), a cooperative effort of antivirus researchers and member companies worldwide. Though approximately 100,000 viruses exist, only about 250 are considered in-the-wild threats at any given time.

To further challenge the scanners, AV-Test pitted them against its zoo of approximately 60,000 malware samples. Whereas in-the-wild testing gauges whether a scanner can detect current threats, zoo tests indicate how it might handle a particular class of threats or family of viruses. For example, all of our chosen products performed well (ranging between 90.4 percent and 100

FEATURES COMPARISON

PC-CILLIN BALANCES PERFORMANCE AND USABILITY

MCAfee AND NORTON LEAD IN LAB TESTS, but PC-cillin is easiest to use and offers free phone support.

ANTIVIRUS SCANNER	SELECT 200 DETECTION RATES ¹				Price/ annual renewal (3/15/04) ²	Ease of use	Comments
	Overall malware detection	Win32 malware	Trojan horses	With three- month-old definitions			
Eset NOD32 2 find.pcworld.com/42036	96%	100%	72%	41% ³	\$39/\$27	Good	Fastest scan speed of all the products we tested. Its small footprint is suited for older PCs. Free online support via Web-based form. No phone support. ★★☆☆☆
Grisoft AVG Anti-Virus Professional find.pcworld.com/42034	71%	90%	24%	66%	\$33/ ⁴	Fair	Lackluster detection of zoo viruses and cumbersome interface, but small footprint is ideal for older PCs. Free support via e-mail and fax. No phone support. ★★
Network Associates McAfee Internet Security Suite 6 find.pcworld.com/41982	99%	100%	99%	70%	\$70/\$30	Poor	Top scanning performance, but conflicts and errors make it difficult to use. Free online support chat, and \$39-per-incident (must be resolved in 48 hours) or \$3-per-minute phone support. ★★☆☆☆
Panda Platinum Internet Security find.pcworld.com/42002	93%	99%	72%	58%	\$80/\$70	Very good	Provides relatively good detection and a nice interface. Free online support via Web-based form, \$20-per-incident phone support. ★★☆☆
Symantec Norton Internet Security 2004 find.pcworld.com/42008	98%	100%	98%	51%	\$69/\$30	Good	Very high detection rates, but slow scans. Had a noticeable negative impact on startup and shutdown times. \$29-per-incident phone support. Free online knowledge base. ★★☆☆☆
Best Buy Trend Micro PC-cillin Internet Security 2004 find.pcworld.com/42012	93%	99%	76%	48%	\$49/\$15	Outstanding	Good infection removal and no false positives; includes Web mail protection. Free online knowledge base. Intuitive and easy to use. Free e-mail support. ★★★★★

Performance testing by AV-Test GmbH (www.av-test.org) for PC World. **FOOTNOTES:** ¹ Scores rounded to the nearest percentage point. Scans with three-month-old signatures were performed at highest possible settings; all other scans were run at default settings. All products detected 100 percent of in-the-wild viruses. "Zoo" refers to all malware, including the majority of variants, that has never appeared "in the wild" (outside controlled laboratory settings). See the online version of this article (find.pcworld.com/42084) for more-detailed results. ² The McAfee, Norton, Panda, and PC-cillin antivirus scanners are part of suites that include firewalls and other utilities. Prices are for the entire suites. ³ 54 percent with Advanced Heuristics enabled. ⁴ License is for two years, after which users must purchase a new software package. A basic free version is available as well.

percent detection) against a collection of 12,341 viruses and worms that operate in a 32-bit Windows environment—the type of infectors most common on today’s WildList. But some fared less well with the zoo collection of 14,288 Trojan horses, malware that can’t spread on its own but can be carried by worms or viruses or be hidden within infected downloads. Despite accounting for a significant proportion of all malware, Trojan horses are not included on the WildList. And the antivirus scanners varied considerably more in their handling of these pests: AVG detected just 23.5 percent of the Trojan horses, while the McAfee and Norton scanners nabbed 99 percent and 97.5 percent, respectively.

AV-Test also scanned 20,000 clean files to determine whether the programs would mistakenly identify any as infected. PC-cillin excelled, with no false positives; at the other end of the scale, Eset’s NOD32 misidentified 31 clean files. Even a small number of false positives can be a headache, as they may cause innocent and necessary files to be quarantined or even deleted.

DEALING WITH NEW THREATS

ANTIVIRUS SCANNERS RELY primarily on exact matches to identify malware, but they can sometimes catch infectors not included in their databases by using heuristics. Strictly speaking, *heuristics* refers to the ability to identify new malware based on telltale characteristics—for example, the presence of code that exploits a known vulnerability. In practice, however, heuristics also refers to the use of “fuzzy” pattern matching to identify a new variant of a known virus, using the generic definition of a virus such as Netsky.gen, for instance, to nab a particular brand-new variant such as Netsky.R.

AV-Test gauged heuristics by scanning files containing the newest malware with versions of each program that had last been updated three months prior. McAfee and AVG performed best, catching 70.1 percent and 65.6 percent, respectively, of infected files; NOD32 did worst, at 41.4 percent.

For each antivirus program, AV-Test used the highest possible settings to scan an infected hard drive, though NOD32 was a special case. Beyond the level of heuristics available for disk scans, NOD32 has a higher level called Advanced Heuristics for scanning incoming e-mail and Web traffic (the main routes of infection). AV-Test gauged NOD32’s Advanced Heuristics using an undocumented command-line instruction (`nod32.exe /AH`) to turn the feature on for a disk scan. With its Advanced Heuristics enabled, NOD32’s detection rate jumped to 53.5 percent.

The antivirus scanners in our roundup succeeded only in detecting new members of known malware families. They did not catch any of the truly new viruses—a finding confirmed by AV-Test’s separate outbreak response survey of 22 antivirus companies. For example, none could identify any of the infamous Netsky worms until the vendors issued detection signatures for

them; but once McAfee wrote a generic signature, the scanner was able to detect several variants. Our conclusion: Heuristics offers only hit-and-miss protection. Your best defense lies in other security layers—including firewalls and your own common sense. For example, you should frequently update your antivirus scanner and patch your operating system. For more tips, see April’s “Lock Down Your PC” (find.pcworld.com/41908).

THE SMOOTHEST SCANNERS

HAD WE BASED OUR Best Buy selection on scanning performance alone, McAfee’s suite would have won. But McAfee had serious flaws. For example, we received multiple script errors during the update process, and the program erroneously reported that the virus scanner had been updated when it had not.

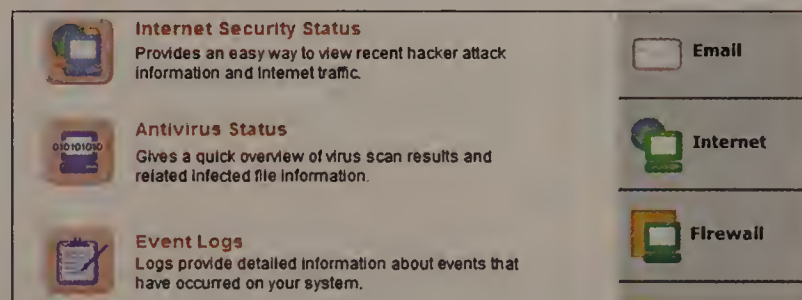
Though McAfee’s suite was the most troublesome, it was not alone in having glitches. No program aced the infection-removal test, in which AV-Test ran each scanner on systems infected with the CTX virus, the Optix

backdoor Trojan horse, and the MyDoom.A worm. PC-cillin handled cleanup best, fully removing two infections and never harming the system. McAfee, NOD32, and Panda left the system unusable after attempting (and failing) to remove the CTX virus.

Sluggishness was the biggest drawback to Norton’s suite. In informal tests, system startups and shutdowns took about twice as long with Norton installed as with PC-cillin or NOD32, which had the least-discernible performance impact. Norton was the slowest at running a full disk scan, too, requiring about 12 minutes on a Windows XP Pro system equipped with an 800-MHz Pentium III processor, 256MB of RAM, and a 5400-rpm hard drive with 575MB of data. NOD32 was the fastest program, at only 52 seconds. (Norton had better detection rates than NOD32, however.) PC-cillin was the next fastest at just over 2.5 minutes.

We awarded our antivirus Best Buy to Trend Micro PC-cillin Internet Security 2004. Besides offering competent scanning at a moderate price, PC-cillin has an exceptionally clean and intuitive interface. Best of all, PC-cillin was the only software product in our review to provide no-cost telephone technical support—and via a toll-free number, too. ▶

SCANNERS RARELY CATCH NEW VIRUSES.



PC-CILLIN KEEPS IT SIMPLE by providing easy access to all components of the security suite via a streamlined interface.

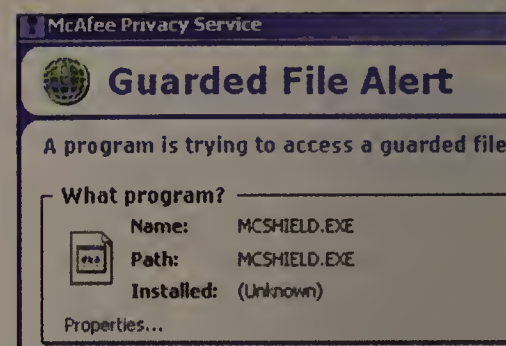
Filling the Gaps: Anti-Spyware

FIREWALLS AND ANTIVIRUS scanners play valuable roles in protecting your system. But they may miss several types of marketing-driven parasites that fall under the general heading of spyware—though this category includes more than just spying applications. For example, browser hijackers, a form of adware, change Registry entries without your approval to redirect your Internet start page or to change the default search service that appears when you mistype a URL. Often called drive-by downloads, many hijackers take advantage of weak security settings, sometimes automatically installing themselves when you visit a Web site. The notorious Surfbar, for example, exploits a flaw in Internet Explorer that allows executable files to download to the user's PC. Also known as Junkbar or Pornbar, Surfbar changes Internet Explorer's start page to www.surferbar.com, drops hundreds of porn site shortcuts onto your desktop, and installs a toolbar pointing to dozens more. Other hijackers do ask

for permission, but in a confusing way that may deceive you into consenting.

Genuine spyware monitors your Internet use, typically to determine what you do online and to deliver targeted advertising. Spyware usually comes packaged with shareware and freeware programs. Often, the end user licensing agreements for this "free" software disclose the real cost: You implicitly agree to allow remote monitoring by third parties that are interested in collecting marketing data or serving targeted ads. Utah recently enacted a state law banning spyware (see find.pcworld.com/41978). But this measure is unlikely to have much impact. For now, anti-spyware provides the best defense.

We evaluated five dedicated anti-spyware packages: Aluria ►



AUTO-IMMUNE PROBLEM? McAfee's Privacy Service attacks its antivirus app.

FEATURES COMPARISON

AD-AWARE AND SPYBOT PROTECT BEST

NO PRODUCT PROVIDES THOROUGH PROTECTION, however, so your best bet is to combine two anti-spyware scanners.

ANTI-SPYWARE SCANNER	Price/annual renewal (3/15/04)	Scans Registry/memory	Allows scan of select files/folders	Rate of detection and removal	Ease of use	Comments
Aluria Spyware Eliminator find.pcworld.com/42046	\$30/none	Yes/Yes	Yes	29%	Good	Consistently left Registry changes behind and failed to detect and remove some infected files. Prompts for registration during setup, but allows registration only from the Help menu (after the program is installed). ★★☆☆☆
InterMute SpySubtract Pro Version 2 find.pcworld.com/42048	\$30/none	Yes/Yes	No	29%	Outstanding	The spyware detection was poor, but the comprehensive Internet and file-use history cleaning will deny much of your personal data to spyware. ★★☆☆☆
Best Buy Lavasoft Ad-aware 6 Plus find.pcworld.com/45414	\$27/none	Yes/Yes ¹	Yes	57%	Outstanding	Thorough in detecting spyware and easy to navigate, but it left some Registry keys behind after cleaning. Ad-watch performs real-time monitoring. ★★★★★
Network Associates McAfee AntiSpyware find.pcworld.com/42050	\$40/ ²	Yes/Yes	No	43%	Good	Achieved one of the higher rates of detection, cleanly removing any malware found, but the real-time monitor failed to prevent spyware infections from occurring. ★★☆☆☆
Network Associates McAfee Internet Security Suite 6 ³ find.pcworld.com/41982	\$70/\$30	Yes/Yes	Yes	14%	Poor	Detected all Registry change attempts, but failed to catch changes made by spyware already on the system. Privacy Service failed to detect processes responsible for infection. ★★☆☆☆
Panda Platinum Internet Security ³ find.pcworld.com/42002	\$80/\$70	No/Yes	Yes	0%	Very good	Ineffective spyware removal; unable to identify most spyware program files during scan of test set. ★★☆☆☆
Best Buy Spybot Search & Destroy find.pcworld.com/42052	Free ⁴	Yes/Yes	No	57%	Good	Free product has some of the best spyware detection and cleaning capabilities available, but memory-resident scanning ability is very limited. ★★★★★
Symantec Norton Internet Security 2004 ⁵ find.pcworld.com/42008	\$69/\$30	No/Yes	Yes	14%	Good	Identified nearly all spyware application files on disk but was ineffective at removing them. Does not scan the Registry, but does include an Internet privacy utility. ★★☆☆☆
Trend Micro PC-cillin Internet Security 2004 ³ find.pcworld.com/42012	\$49/\$25	No/Yes	Yes	0%	Outstanding	Able to detect spyware applications on disk but could not remove them. Does not scan for Registry changes. Firewall privacy controls block sending of personal information items that the user has predefined. ★★☆☆☆

FOOTNOTES: ¹ Ad-watch, Ad-aware's memory-resident component, is available only in the paid version. ² Network Associates has not yet determined a renewal policy. ³ Spyware scanner is part of a suite that includes a firewall and other utilities. ⁴ Software author requests donations. ⁵ Spyware scanner is a component of the suite's antivirus utility, which is available separately for \$50.



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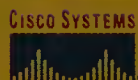
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Spyware Eliminator, InterMute SpySubtract Pro Version 2, Lavasoft Ad-aware 6 Plus, Network Associates McAfee AntiSpyware, and Spybot Search & Destroy. (New editions of two other popular utilities—PestPatrol and Webroot Spy Sweeper—were not available in time for our review.) We also tested the spyware-hunting capabilities of the antivirus scanners and other utilities contained in the Internet security suites from Network Associates, Panda, Symantec, and Trend Micro. Unfortunately, even the best performers managed to capture only a little more than half of our spyware samples. For the time being, your best strategy is to use multiple anti-spyware scanners.

During informal tests, we infected a system with an array of spyware. Norton identified only two of the seven spyware infections as they were occurring; PC-cillin and Panda alerted only on one each. When we ran the antivirus suite scanners on a system that had already been infected, they detected the executable file that creates the nefarious Surfbar infection, but they did not remove the installed toolbar, porn site shortcuts, and hijacked home page. Though McAfee's Privacy Service accurately detected all attempts to modify the Registry and urged us to reject them, it didn't detect the underlying processes in memory that were responsible for the attempts at modification. So as soon as we rejected one set of changes, another assault occurred, resulting in an endless cycle of alert and rejection until we finally capitulated to the infection.

Unlike antivirus apps that match incoming files against malware signatures to determine whether they are infected, anti-spyware products rely heavily on Registry keys and values. Spybot Search & Destroy and Ad-aware had the most reliable detection in our tests, but Spybot Search & Destroy was best at removing bad files and restoring Registry values.

Although McAfee AntiSpyware detected three infectors—Gator, Huntbar, and MyFastAccess—it removed only the latter two completely. SpySubtract Pro 2 was the weakest of all, detecting only one spyware sample: the widely known Gator dashboard.

We liked the real-time protection that Ad-aware Plus's Ad-watch com-

ponent provided. In our tests, Ad-watch foiled every hijacker that tried to change our Internet preferences. (Note that the basic, free version of Ad-aware does not include the Ad-watch component.)

None of the scanners we tested even approached 100 percent detection and removal, but Spybot Search & Destroy and Lavasoft Ad-aware Plus were the most capable. In general, Ad-aware does a better job of spotting pure

adware, while Spybot is more adept at detecting pure spyware. They are also about tied in other features: We found Ad-aware 6 Plus much easier to use, and it came with Ad-watch; but Spybot Search & Destroy demonstrated superior cleaning ability.

SOUR ON THE SUITES

IN A PERFECT WORLD, we wouldn't need multiple layers of online protection. In an almost-perfect world, a single security suite of products from the same vendor would suffice. Unfortunately, none of the suites we tested vigilantly watched all vulner-

able areas. For instance, none of them were proficient at recognizing and eradicating spyware.

Overall, though, Trend Micro's PC-cillin Internet Security 2004 was the best of the suites, with the top antivirus scanner and one of the best firewalls. Combining it with the free Spybot Search & Destroy provides a good measure of security for just \$50. For even stronger spyware protection, you can get Lavasoft's Ad-aware 6 Plus. (All three programs worked together without conflict in our tests.) PC-cillin's firewall is a good choice for most users. If you can spend more money and effort to bolster your support, disable PC-cillin's firewall and install ZoneAlarm Pro 4.5. (A basic, free version of ZoneAlarm is also available.)

Regrettably, none of the suites in this review had a top-notch antispyware utility, but some stand-alone products performed quite well. To find out more, turn the page. ■

Mary Landesman is an antivirus researcher and consultant, and serves as the antivirus guide for About.com. Andreas Marx of AV-Test directed all firewall and antivirus lab testing.

ANTI-SPYWARE UTILITIES STILL DISAPPOINT.

STRATEGY

DEFENSE IN DEPTH

LAYERS OF PROTECTION block different kinds of threats and may provide backup if one layer fails.

Hardware router

- Using NAT,¹ masks IP address from port scans.
- Blocks unsolicited incoming communications.
- Does not protect against most malware, such as Trojan horses, viruses, e-mail worms, and spyware.

Software firewall

- Prevents backdoor apps, Trojan horses, and unwanted applications from sending data from the PC.
- Protects a laptop on public wired and wireless networks.
- Can block some malware, but can't remove it.

Antispam software

- Blocks deceptive e-mail scams (phishing schemes).
- Reduces e-mail sorting fatigue, so users are less likely to accidentally activate an e-mail-borne virus in haste.

Antivirus software

- Protects against known worms, viruses, and Trojan horses but is less effective against new infectors.
- Systems are still vulnerable to infiltration from adware, spyware, and browser hijackers.

Anti-spyware software

- Protects against adware, browser hijackers, spyware, tracking cookies, and other Internet parasites.

¹The Network Address Translation Internet standard allows LANs to use different sets of IP addresses for internal and external traffic.

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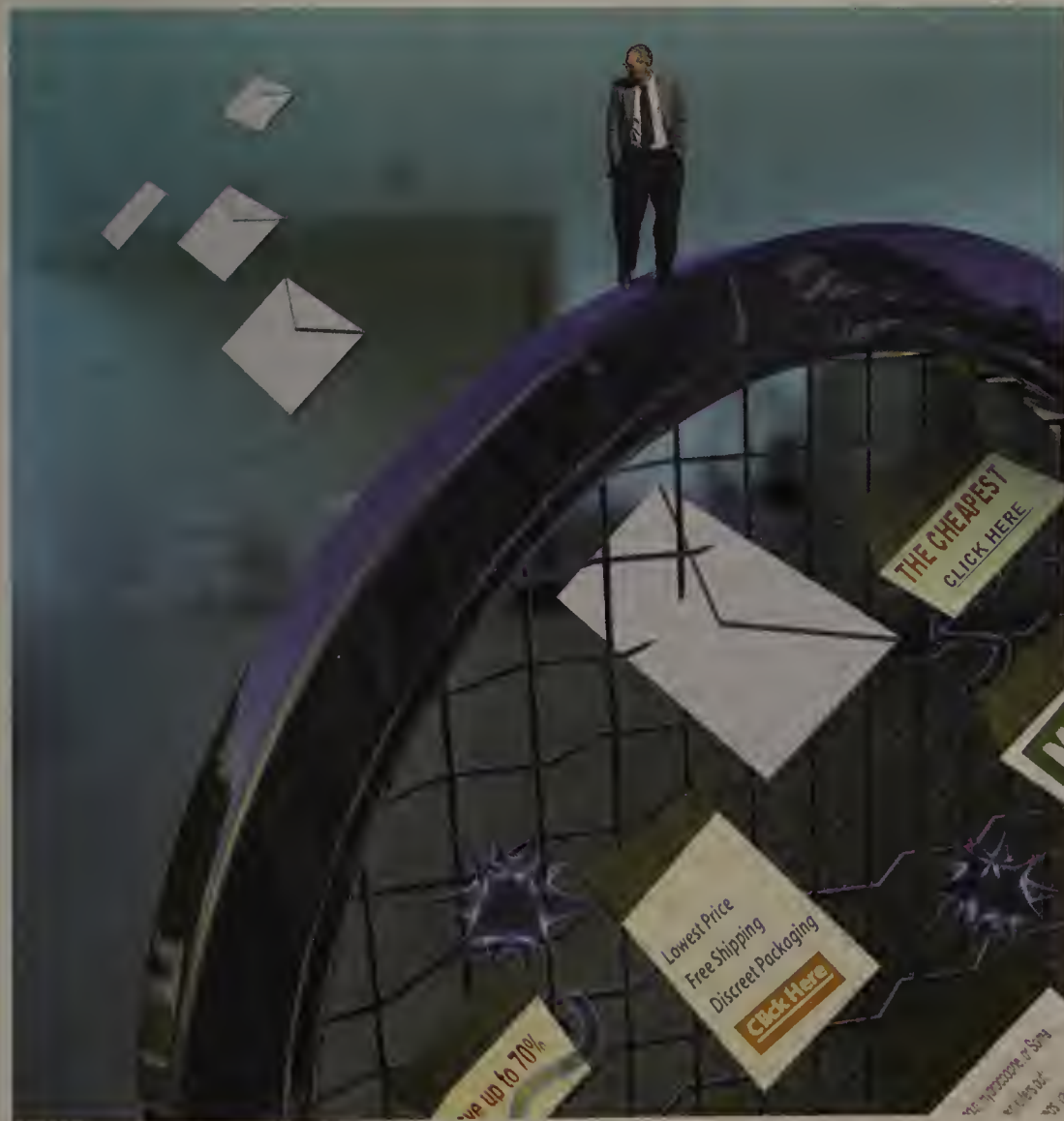
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Spam-Proof Your In-Box

Yes, you can turn the tide against junk e-mail. Our ratings of nine antispam tools reveal a surprising Best Buy.

By Logan G. Harbaugh



ASK PEOPLE WHAT they find most irritating about the Internet, and you are almost guaranteed to hear a certain four-letter word: spam. In the past year alone, the volume of spam has ballooned—at some ISPs, junk messages now account for more than 75 percent of all e-mail. Fortunately, spam-filter software is improving.

As an analyst who reviews the kinds of filters used by large companies for *InfoWorld* (a sibling publication to *PC World*), I didn't expect desktop filters to beat enterprise-class products. After all, corporate spam services like Postini and Brightmail collect huge quantities of spam, and distill the essence of that junk to improve their filters. But two desktop tools I reviewed (including Cloudmark's SpamNet, our Best Buy) blocked more than 98 percent of junk mail—a huge improvement over the products in May 2003's review (find.pcworld.com/41954). Keeping a low rate of false positives (real mail mistaken by the filter as spam) is critical, too. You don't want important e-mail to get dumped in the trash along with the herbal Viagra ads. SpamNet flagged only 17 of the 1082 non-junk e-mail messages as spam. ►

I tested nine spam filtering tools in all (see find.pcworld.com/42060 for the complete testing regime). Four filter products (from Network Associates, Panda, Symantec, and Trend Micro) are components of security suites reviewed in “Bigger Threats, Better Defense” (page 74). In general, the suites with spam filters sorted through e-mail less accurately than did the stand-alone spam filter products—a result that jibes with the findings about antivirus and firewall software reported in that story.

For accuracy’s sake, each tool required some initial “training” about kinds of e-mail it should not filter out. The four most accurate products in this review—SpamNet, InBoxer, IHateSpam, and SpamCatcher—did a good job with little training. These products collect information from users’ filtering choices to help identify (and then create new filters to block) new forms of spam. When accuracy counts, human judgment trumps AI every time.

Aladdin Systems SpamCatcher

OF THE FILTERING TOOLS TESTED, SpamCatcher (\$30, www.aladdinsys.com) was among the simplest to install and operate. The tool integrates into Outlook, and will work with any POP3 e-mail client application. After training, SpamCatcher branded 46 legitimate messages as spam—a moderate amount.

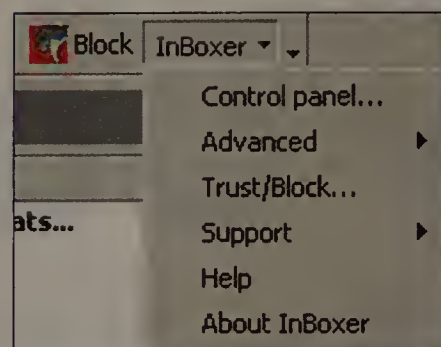
A key component of the application is something Aladdin calls the SpamCatcher network. As you mark particular messages as spam, the program reports certain details about the junk e-mail to the network. The company then incorporates these details into software updates, improving the filtering accuracy for everyone.

All of the messages that SpamCatcher misidentified as spam

were mass mailings, such as newsletters. Some filtering applications have a more difficult time with legitimate bulk messages because these often contain elements common to spam messages, such as unsubscribe information, prices, or links. The program didn’t brand any nonspam messages from individuals as spam.

Audiotrieve InBoxer

INBOXER (\$28, www.inboxer.com) beat down more spam than any other product in this review, while maintaining an acceptably low rate of false positives. InBoxer 1.1 works only with Outlook, from 2000 through



INBOXER’S controls are one mouse click away in the Outlook toolbar.

2003, and not with any other mail software. This limitation kept it from capturing our Best Buy award; but it’s well worth a look if you use Outlook exclusively to read e-mail.

InBoxer’s accuracy impressed me. The program let 26 out of 2135 spam messages—or about 1.3

percent—slip through. This level of accuracy puts InBoxer ahead of some sophisticated and expensive corporate filters.

The application mistook only one real message from an individual user for spam. It was slightly less accurate with legitimate bulk mail (such as e-mail newsletters I’d signed up for), but not to an extent that made the problem onerous to deal with. The

CHALLENGE/RESPONSE

THE 100 PERCENT ACCURATE SPAM FILTER



IT HAS BEEN SEVERAL years since you could look for a specific word in e-mail to get rid of spam. Besides, to sneak past filters, spammers use different methods that change almost from hour to hour.

The most effective spam filters are *permission-based* tools, which block messages sent by anyone who isn’t on your whitelist. That’s great if your only wanted e-mail comes from friends and family members. But if you occasionally receive unexpected e-mail that you want to get, blocking every unknown sender won’t work. That’s where challenge/response, or CR, filtering apps come in. The term means that the filter will block e-mail from an unknown source unless the sender of the e-mail replies to a special message correctly.

Here’s how it typically works: Right after your Uncle Sid sends you an e-mail, your CR tool sends him a message directing him to perform some action, such as clicking a

link. If he responds correctly to the challenge, he gets added to the whitelist, and his messages get through from then on.

The challenge defeats spammers because virtually all junk mailers use bogus return addresses, and therefore can never correctly respond. But because the challenge demands a response, this type of tool can inconvenience the sender of the message. Afraid that a sales lead will e-mail someone else rather than go through the hassle of a response, businesspeople dread these kinds of tools even more than spam.

But for home users who bridle at the restrictions of a permission-based filter, and who dislike the hassle of training a rules-based filter, challenge/response filters can cut 100 percent of spam—and that’s a diet that no one would mind sticking to.

program can filter spam out of any previously downloaded mail in your other folders, as well. Most of the other products we tested could only sort through new messages as they were downloaded.

InBoxer's integration with Outlook made training the filter simple. InBoxer creates two folders: 'InBoxer-blocked' and 'InBoxer-review'. Almost all false positives end up in the 'InBoxer-review' folder; since they're stored apart from the obvious spam, these messages are easy to sort through.

Best BUY **Cloudmark SpamNet**
SPAMNET (\$4 per month, www.cloudmark.com) had the lowest false-positive rate of any spam filter I've ever tested (it didn't tag any legitimate messages that were not bulk mail) and a superb catch rate of over 98 percent. Its intuitive interface, virtually effortless filtering, and high success rate should put SpamNet on your short list of filtering products.

SpamNet integrates into the toolbar of Outlook 2000 through 2003 and of Outlook Express 5 and 6, and it can filter e-mail sent from any of these Outlook and Outlook Express versions. The program is free to download, but it costs \$4 per month to use after a 30-day free-trial period ends.

Cloudmark collects data from every installed copy of SpamNet—more than 900,000 users in all. When you block spam manually, the program reports details about the addresses, URLs, subject lines, and text in the junk messages to the company, which uses this information to improve its filter accuracy. As a result, SpamNet sorted through junk mail extremely accurately, even before training ended. It missed just 37 spam messages (out of 2135 in the test pool), and recorded only 17 false positives out of 1082 legit messages—the fewest false positives of all the tested products.

Lyris Technologies MailShield

MAILSHIELD (\$60, www.lyris.com) delivered the poorest filtering accuracy of the nine products I tested, permitting 796 spam messages—more than a third of the total volume of spam—to slither into the test system's in-box, even after training. Compounding the problem, MailShield

FEATURES COMPARISON

STAND-ALONE FILTERS BEAT SUITES

FILTERS BUNDLED with suites (like PC-cillin) didn't do as well as pure spam filters (like InBoxer).

SPAM FILTER	Street price ¹	Accuracy ² (higher is better)	False positives ³ (lower is better)	E-mail clients supported ⁴
Aladdin Systems SpamCatcher 3.0.1 ★★★★☆ find.pcworld.com/42020	\$30	91.1%	4.3%	Any POP3 e-mail client; integrates with Outlook
Audiotrieve InBoxer 1.1 ★★★★★ find.pcworld.com/42014	\$28	98.7%	3.0%	Integrates with Outlook
Best BUY Cloudmark SpamNet ★★★★★ find.pcworld.com/42010	\$48 ⁵	98.2%	1.6%	Integrates with Outlook
Lyris Technologies MailShield 3.11 ★★ find.pcworld.com/42028	\$60	62.7%	13.0%	Any POP3 e-mail client
Network Associates McAfee SpamKiller 5.0 ★★★☆☆ find.pcworld.com/42024	\$35	70.7%	22.3%	Any POP3 e-mail client
Panda Software Platinum Internet Security ★★ find.pcworld.com/42026	\$80 ⁶	75.3%	37.0%	Integrates with Outlook
Sunbelt Software IHateSpam 4 for Outlook ★★★★★ find.pcworld.com/42016	\$20	96.2%	2.4%	Integrates with Outlook
Symantec Norton AntiSpam 2004 ★★★☆☆ find.pcworld.com/42022	\$40	79.5%	5.2%	Integrates with Outlook
Trend Micro PC-cillin Internet Security 2004 ★★★★☆ find.pcworld.com/42018	\$50	86.3%	6.9%	Any POP3 e-mail client

FOOTNOTES: ¹ Price is rounded to nearest whole dollar and includes one year of spam filter updates. ² Percentage of spam messages caught by filter. ³ Percentage of nonjunk messages mistakenly filtered as spam. ⁴ By tested version. Some companies sell versions that integrate with other clients. ⁵ Cloudmark's service costs \$4 per month. ⁶ Panda offers a version with six months of updates (instead of a full year) for \$40. See find.pcworld.com/42060 for details on how we tested these products.

incorrectly marked 141 of 1082 legitimate messages as spam.

MailShield can filter mail from any POP3 e-mail client. It runs as a separate program, idling in the system tray but springing to life when you check your e-mail. Through MailShield's interface you can delete spam messages before they get to your e-mail program, and you can pass along suspect but legitimate messages from their quarantine to your in-box.

Working through the separate interface makes training the software needlessly cumbersome. You have to launch the MailShield app, rather than using the familiar interface of your e-mail software, to identify spam or unblock false positives. And even with training, the application's accuracy at sorting out the junk left a lot to be desired.

Network Associates McAfee SpamKiller

SPAMKILLER (\$35, www.mcafee.com) is part of a security suite that also installs McAfee Virus-Scan. This can cause conflicts if you use another antivirus product on your computer. Spam-Killer permitted 625 pieces of junk—nearly 30 percent of all spam—to pass through the fil- ►

Community Statistics	
SpamFighters	901,222
Time saved (days)	5,697
Money saved	\$2,734,375
Emails processed	230,558,817
Spam caught	49,218,748
My Statistics	
Time saved (hours)	6
Money saved	\$116
Emails processed	3,579
Spam caught	2,081
Spam I've blocked	24

SPAMNET keeps a running tally of how much time and money you're saving by using the application.

ter, and it incorrectly identified 241 legitimate messages as spam.

The application shows the spam it has blocked—and lists the nonspam mail that it has passed along to the e-mail software—in its own interface. Managing messages through the SpamKiller interface took an annoyingly long time on my test system, which had a 1-GHz Pentium III processor and 512MB of RAM. To unblock legitimate mail, you have to click a single message, wait a few seconds for the program to acknowledge your selection, click the Rescue button, wait some more, and then move on to the next message. And because SpamKiller filtered out spam a lot less accurately than did most other products in this review, there were a lot of messages I needed to sort through—very slowly.

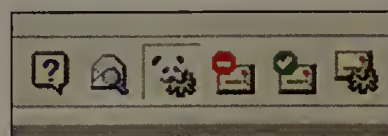
But the user interface's pokiness wasn't SpamKiller's only problem. There was no search function for finding all messages from a given sender, which would have simplified releasing batches of newsletter messages at once. And whitelisting doesn't release a sender's other e-mail from quarantine, either—you have to break each legit message out of spam-jail individually.

Representatives from Network Associates report that, after I

completed my testing of SpamKiller for this story, the company released an updated version 5.1 of SpamKiller that addresses some of the system performance problems and user interface quirks that I noted during testing. Specifically, for SpamKiller 5.1, Network Associates increased the prominence of some of its more important features in the menu hierarchy, and made selecting and manipulating multiple messages easier than these tasks used to be. I was unable to test the update before press time.

Panda Software Platinum Internet Security

PANDA'S ANTISPAM PRODUCT (\$80, www.pandasoftware.com), part of an Internet security suite, delivered by far the highest number of false positives (400 out of a possible 1082) of any of the



PANDA adds a few user-friendly icons to the Outlook toolbar.

programs I tested. Panda Platinum removed about 75 percent of actual spam messages, meaning that more than 500 spam messages ended up in my in-box after training. ►

SPAM TIPS

LET YOUR INTERNET PROVIDER DO THE BLOCKING



DON'T WANT TO pay for spam filtering software? You might want to consider using the mail scrubbing tools that your ISP provides instead. If you use a major national ISP, the company's filter can screen out as much junk as the average desktop filtering app—if you take the time to train it. Here's a roundup of tools and techniques that the national ISPs use to remove spam from their customers' in-boxes.

EarthLink's SpamBlocker lets the customer choose how aggressively the ISP should filter spam. The lowest level lets everything through; the middle level uses Brightmail. (In *InfoWorld* tests, Brightmail's spam-filtering accuracy averaged 96 percent, with a false-positive rate of less than 1 percent.) The highest level permits only messages from senders in the user's address book.

United Online (the parent company of NetZero, Juno, and BlueLight) uses content filters (tools that scan the subject and body of messages for keywords), whitelists, blacklists, and a spam reporting system.

MSN Premium and Plus and Hotmail use Brightmail as well as a Microsoft filtering tool that you train over time. MSN Premium and Plus offer five levels of filtering for junk e-mail; the highest level allows an MSN customer to get e-mail only from people listed in the user's MSN address book.

SBC Yahoo's Anti-Spam Resource Center (sbc.antispam.yahoo.com) provides a personalized filter that augments systemwide filtering. SBC uses a Real-time Blackhole

List, detects and blocks spam servers not yet on the RBL, and blocks any computer on SBC's DSL network that sends mass amounts of e-mail.

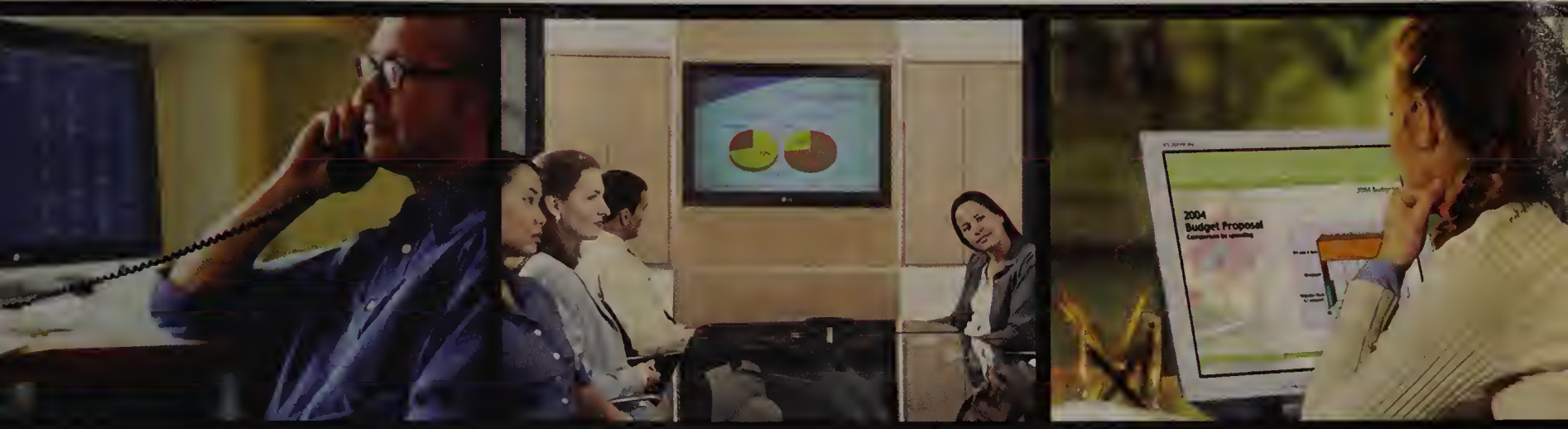
At press time, DSL ISP Speakeasy said that it was switching to a tool based on the open-source SpamAssassin (which, in tests for *InfoWorld*, cleaned out spam e-mail with 93 percent accuracy).

Cox Communications, a cable ISP, uses filters (see coxagainstsam.cox.net for more information) based on Brightmail.

Cable ISP Adelphia Communications scans its network for customer PCs that are vulnerable to takeover by spammers. It also filters with Brightmail and uses RBLs to cut off spam-friendly networks.

Comcast Communications, another cable ISP, uses a combination of several commercial products that the company rep declined to name. In addition, the company probes its network for spam zombies—PCs that are being controlled by spammers without the owners' knowledge. If the probe discovers a zombie PC, Comcast notifies the customer first; then if the problem doesn't get fixed, it cuts off Internet service temporarily until the enslaved PC can be dezombified.

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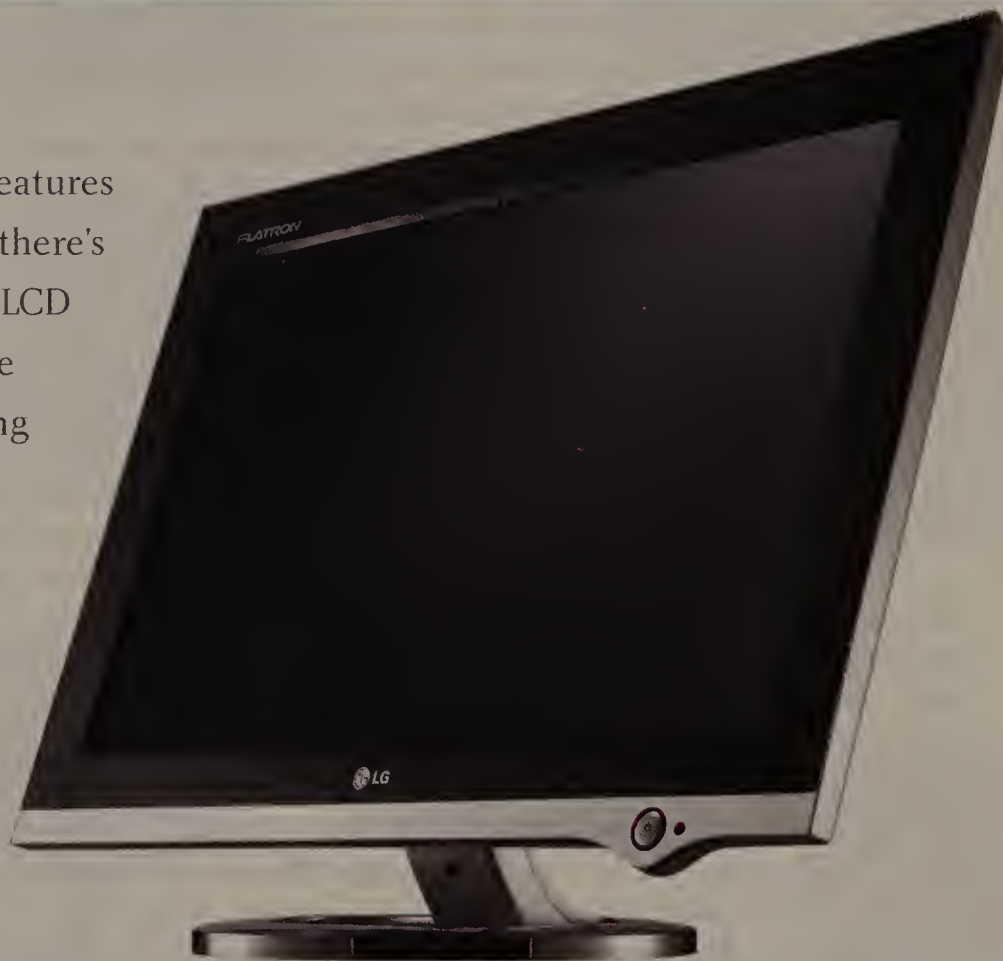
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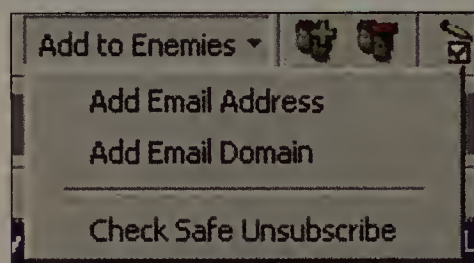


Panda's suite installs an antivirus program, anti-spyware software, and a firewall in addition to the antispam tool. Unfortunately, it's all or nothing: You can't choose individual programs to install à la carte, the installer gives you no option to refrain from installing other parts of the suite (you can disable them afterward, however), and you must remove any other antivirus program you have on your PC before Panda will install.

The Panda Platinum suite adds buttons to Outlook's toolbar to help you quickly whitelist false positives and identify missed spam for deletion. That's convenient, considering that I had to correct the more than 900 mistakes it made.

Sunbelt Software IHateSpam for Outlook

IHATESPAM 4 FOR Outlook (\$20, www.sunbelt-software.com) delivered a high degree of filtering accuracy, with a very low false-positive rate. Only SpamNet and InBoxer caught more spam, but the difference was a couple dozen spam messages (out of 2135 total). Sunbelt sells versions customized to integrate with a particular program. I tested the Outlook version; other versions plug in to Outlook Express, MSN Hotmail, Incredimail, and Eudora.



IHATESPAM lets you blacklist a single address or an entire domain all at once.

After locating and scanning the Outlook address book, IHateSpam added those addresses to its whitelist. The program adds a toolbar to Outlook that lets you cull spam from whatever mail folder you're browsing (a handy feature), designate messages as spam or legitimate, and whitelist or blacklist a sender's mail domain or address.

Among its unique features, IHateSpam can block e-mail that seems to be written in foreign alphabets—a common feature of spam that originates from Asia or eastern Europe. The application uses Sunbelt's Spam Learning Network Community to collect information about spam (such as the body and subject text) from users of the software; the data helps the company improve the filtering accuracy for all IHateSpam users. The 'Add to friends' menu item can exclude either specific senders or their mail domains from future blocking, while the 'Add to enemies' item blacklists individuals or domains.

IHateSpam slowed Outlook's responsiveness slightly, though not nearly as much as Norton AntiSpam did. With the program loaded on my test system, I detected a slight pause when I selected messages inside Outlook—less than a second, but noticeably longer than before I installed IHateSpam.

Symantec Norton AntiSpam

NORTON ANTISPAM 2004 (\$40, www.symantec.com) stopped just under 80 percent of the spam in my tests, putting it solidly in the middle of the pack for accuracy. Its integration into Out-

look, Outlook Express, and Eudora is a nice touch, but the program made my test system run dog-slow, though my hardware exceeded Symantec's minimum requirements.

After I installed AntiSpam, for example, clicking a mail folder to open it caused my PC to chug for several seconds before it reacted. Even when AntiSpam wasn't actively filtering, Outlook responded much more slowly when I tried to open messages, access folders, delete existing mail, or empty the trash. And downloading mail took about five times longer than it did before AntiSpam was installed.

Though the program can import the address book from Outlook, it took longer than 5 minutes to accomplish this task with our sample (which contained 1046 names and addresses). In contrast, IHateSpam took just 15 seconds to do the same thing.

Trend Micro PC-cillin Internet Security

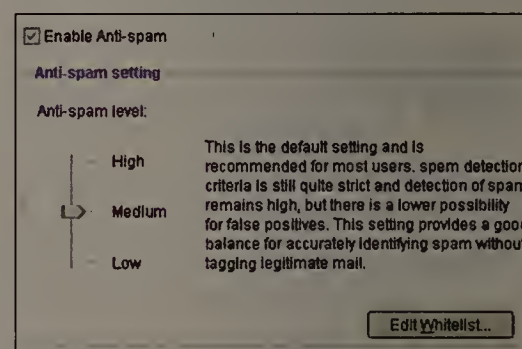
LIKE SEVERAL OTHER PRODUCTS from large, well-known companies, PC-cillin (\$50, www.trendmicro.com) is a suite that includes a spam filter as part of a package with antivirus, a firewall, anti-spyware software, and parental controls. This product offered reasonable accuracy, catching 86 percent of my spam, but it was saddled with a fairly high false-positive rate of 6.9 percent.

But unlike any other product I tested, PC-cillin didn't actually delete anything. The program simply adds "spam:" to the beginning of the subject line for any messages it thinks are junk. You have to create a filtering rule in your mail software to deal with those messages, but that step isn't part of the installation.

Following the same pattern I saw with McAfee SpamKiller and Panda Platinum, PC-cillin doesn't play well with other applications. It checks for existing installations of antivirus products, and it requires you to uninstall any other antivirus application before you install the PC-cillin suite.

PC-cillin lets you adjust only one setting: a slider for establishing a low, medium, or high level of aggressiveness in identifying spam. And beyond adding a whitelist of e-mail addresses, you can't

train the program to improve its filtering accuracy. Adding addresses to the whitelist isn't hard, but you can access the whitelist only through the PC-cillin interface, not from within Outlook. If you're considering buying PC-cillin's suite for its Best Buy-winning antivirus tool (see page 78), the spam filter is serviceable, but it's nowhere near the best of the bunch. ■



RATCHETING UP the aggressiveness of PC-cillin can create more false positives.

Logan G. Harbaugh, a freelance writer based in Redding, California, tests spam filtering tools for InfoWorld and PC World.

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512 DDR 2100 SDRAM
DVD/CDRW Combo Drive
56K v.92 Modem & 10/100 NIC
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3-in-1 Card Reader
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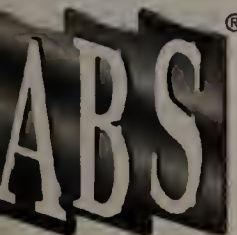
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Intel® Centrino™ Mobile Technology
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15" XGA TFT Display
60GB 5400RPM Hard Drive
512MB DDR 2100 SDRAM
DVD-ROM/CD-RW Combo Drive
56K V.92 Modem & 10/100 NIC
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cowboy

lasso

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IBM recommends Microsoft®
Windows® XP Professional
for Business.

IBM ThinkPad R51

Distinctive IBM Innovations:

- Access Connections – Easiest wired and wireless connectivity

System Features:

- Intel® Centrino™ Mobile Technology
 - Intel Pentium® M Processor 1.50GHz¹
 - Intel PRO/Wireless Network Connection 802.11b/g²
- Microsoft Windows XP Home Edition³
- 14.1" XGA TFT display (1024x768)
- 128MB DDR SDRAM⁵ • 20GB⁴ hard drive
- Ultrabay™ Enhanced CD-ROM
- IBM UltraNav™ – TrackPoint® and touch pad
- 1-yr system/battery limited warranty⁶

\$1,199*  NavCode 28872KU-M224

ServicePac® Service Upgrade:⁷
3-yr Depot Repair #30L9192 **\$132**

NEW! IBM ThinkPad X40

Distinctive IBM Innovations:

- Rapid Restore™ – Push-of-a-button data backup and recovery

System Features:

- Intel Centrino Mobile Technology
 - Intel Pentium M Processor ULV 1GHz
 - Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 12.1" XGA TFT Display (1024x768)
- 256MB DDR SDRAM • 20GB hard drive
- Integrated Gigabit Ethernet and modem
- Legendary IBM full-size keyboard⁸
- Only .94" thin¹⁰ • 2.7-lb travel weight¹⁰
- 1-yr system/battery limited warranty⁶

\$1,499  NavCode 23861CU-M224



Wireless IBM PCs give users the easiest wired and wireless connectivity. So you can rein in help desk calls. Yeehaa!

Outfit users with IBM ThinkPad® notebooks including Access Connections software and wireless Intel® Centrino™ Mobile Technology (select models), and you may experience something really wild: a quieter help desk. Because Access Connections helps users switch between wired and wireless settings at the drop of a hat. So whether you're working on upgrades, security enhancements or integration, you won't have to keep diverting resources to help users connect. Wireless IBM ThinkPad notebooks with Access Connections software. Welcome to the new wireless frontier. **think freedom**

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Save on shipping. Order online.⁹

personal, family or household purposes. Service period begins with the equipment date of purchase. Service levels are response-time objectives and are not guarantees. If the machine problem turns out to be a Customer Replaceable Unit (CRU), IBM will express ship the part to you for quick replacement. Onsite 24x7x2-hour service is not available in all locations. For ThinkPad notebooks requiring LCD or other component replacement, IBM may choose to perform service at the depot repair center. **(8) Full-size keyboard:** As defined by ISO/IEC 15412. **(9) Shipping:** Standard shipping included when you order online. U.S. only. **(10) Travel Weight:** includes battery and optional travel bezel instead of standard optical drive in Ultrabay bay, if applicable; weight may vary due to vendor components, manufacturing process and options. **Thinness:** may vary at certain points on the system. **Trademarks:** The following are trademarks or registered trademarks of IBM Corporation: IBM, the IBM logo, ThinkPad, Ultrabay and UltraNav. Microsoft and Windows are registered trademarks of Microsoft Corporation. Intel, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Intel SpeedStep and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Other company, product and service names may be trademarks or service marks of other companies. ©2004 IBM Corporation. All rights reserved.

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Power. Security. Wireless. Talk about a roundup.



IBM ThinkPad® R51

Distinctive IBM Innovations:

- IBM Embedded Security Subsystem 2.0¹ – Strongest security as a standard feature

System Features:

- Intel® Centrino™ Mobile Technology
 - Intel Pentium® M Processor 1.50GHz²
 - Intel PRO/Wireless Network Connection 802.11b/g³
- Microsoft Windows XP Professional⁴
- 14.1" XGA TFT Display (1024x768)
- 256MB DDR SDRAM⁵ • 20GB⁶ hard drive
- Integrated Ethernet and modem
- Ultrabay™ Enhanced CD-RW/DVD-ROM combo
- IBM UltraConnect™ Antenna for increased signal strength¹²
- 1-yr system/battery limited warranty^{9A}

\$1,299*

NavCode 28832XU-M224

ServicePac® Service Upgrade:¹⁰

3-yr Depot Repair

#30L9192 ***132**

IBM ThinkPad T41

Distinctive IBM Innovations:

- Access IBM – IBM help at your fingertips
- IBM Active Protection System – Airbag technology to help protect your ThinkPad

System Features:

- Intel Centrino Mobile Technology
 - Intel Pentium M Processor 1.40GHz
 - Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 14.1" XGA TFT Display (1024x768)
- 256MB DDR SDRAM • 40GB hard drive
- Integrated Gigabit Ethernet and modem
- Ultrabay Slim CD-RW/DVD-ROM combo
- IBM UltraConnect Antenna for increased signal strength
- Only 1" thin⁸ • 4.5-lb travel weight⁸
- 1-yr system/battery limited warranty^{9A}

\$1,679

NavCode 2378DHU-M224

With Microsoft Office Small Business Edition 2003:¹⁴ \$1,919

ServicePac® Service Upgrade:

2-yr Onsite Repair/9x5/Next Business Day Response

#30L9189 ***197**

IBM ThinkPad R51

Distinctive IBM Innovations:

- Rapid Restore™ – Push-of-a-button data backup and recovery

System Features:

- Intel Centrino Mobile Technology
 - Intel Pentium M Processor 1.50GHz
 - Intel PRO/Wireless Network Connection 802.11b/g
- Microsoft Windows XP Professional
- 15" SXGA+ TFT Display (1400x1050)
- 256MB DDR SDRAM • 40GB hard drive
- Integrated Ethernet and modem
- Ultrabay Enhanced CD-RW/DVD-ROM combo
- IBM UltraNav™ TrackPoint® and touch pad
- 1-yr system/battery limited warranty^{9A}

\$1,499

NavCode 1836BDU-M224

IBM ThinkPad T41

Distinctive IBM Innovations:

- IBM Active Protection System – Airbag technology to help protect your ThinkPad

System Features:

- Intel Centrino Mobile Technology
 - Intel Pentium M Processor 1.60GHz
 - Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 14.1" SXGA+ TFT Display (1400x1050)
- 256MB DDR SDRAM • 40GB hard drive
- Ultrabay Slim CD-RW/DVD-ROM combo
- Integrated Gigabit Ethernet and modem
- IBM UltraConnect Antenna for increased signal strength
- Only 1" thin • 4.5-lb travel weight
- 3-yr system/1-yr battery limited warranty^{9A}

\$1,939

NavCode 2379DJU-M224

With Microsoft Office Small Business Edition 2003: \$2,179

ServicePac® Service Upgrade:

5-yr Onsite Repair/9x5/Next Business Day Response

#69P9200 ***449**

NEW! IBM ThinkPad X40

Distinctive IBM Innovations:

- Rapid Restore – Push-of-a-button data backup and recovery
- IBM Active Protection System – Airbag technology to help protect your ThinkPad

System Features:

- Intel Centrino Mobile Technology
 - Intel Pentium M Processor ULV 1GHz
 - Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 12.1" XGA TFT Display (1024x768)
- 256MB DDR SDRAM
- 20GB hard drive
- Integrated Gigabit Ethernet and modem
- Legendary IBM full-size keyboard¹⁶
- Only .94" thin
- 2.7-lb travel weight
- 1-yr system/battery limited warranty^{9A}

\$1,499

NavCode 23861CU-M224

ServicePac® Service Upgrade:

3-yr Depot Repair

#30L9192 ***132**

NEW! IBM ThinkPad X40

Distinctive IBM Innovations:

- Longest standard battery life of any leading brand notebook¹⁵

System Features:

- Intel Centrino Mobile Technology
 - Intel Pentium M Processor LV 1.20GHz
 - Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 12.1" XGA TFT Display (1024x768)
- Intel Extreme Graphics
- 256MB DDR SDRAM
- 40GB hard drive
- Integrated Gigabit Ethernet and modem
- Legendary IBM full-size keyboard
- 7.5-hr Li-Ion battery⁷
- 3.2-lb travel weight
- 1-yr system/battery limited warranty^{9A}

\$1,749

NavCode 23866GU-M224

ServicePac® Service Upgrade:

4-yr Depot Repair

#69P9195 ***249**

NEW! IBM ThinkPad X40 Solution Pack

Distinctive IBM Innovations:

- Access Connections – Easiest wired and wireless connectivity
- **NEW!** IBM Rescue and Recovery™ with Rapid Restore: One-button recovery and restore solution

System Features:

- Intel Centrino Mobile Technology
 - Intel Pentium M Processor ULV 1GHz
 - Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 12.1" XGA TFT Display (1024x768)
- 256MB DDR SDRAM
- 20GB hard drive
- 2.7-lb travel weight
- 1-yr system/battery limited warranty^{9A}

Accessories Included:

- ThinkPad X40 UltraBase Dock
- Ultrabay Slim CD-RW/DVD-ROM combo

\$1,799

NavCode 23861ZU-M224

ServicePac® Service Upgrade:

3-yr Onsite Repair/9x5/Next Business Day Response

#30L9195 ***243**

NEW! IBM ThinkPad X40 Solution Pack

Distinctive IBM Innovations:

- Longest standard battery life of any leading brand notebook

System Features:

- Intel Centrino Mobile Technology
 - Intel Pentium M Processor LV 1.20GHz
 - Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 12.1" XGA TFT Display (1024x768)
- 256MB DDR SDRAM
- 40GB hard drive
- Integrated Gigabit Ethernet and modem
- 7.5-hr Li-Ion battery
- 3-yr system/1-yr battery limited warranty^{9A}

Accessories Included:

- ThinkPad X40 UltraBase Dock
- Ultrabay Slim CD-RW/DVD-ROM combo

\$2,199

NavCode 23826UU-M224

ServicePac® Service Upgrade:

4-yr Onsite Repair/9x5/Next Business Day Response

#69P9198 ***299**

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Availability: All offers subject to availability. IBM reserves the right to alter product offerings and specifications at any time, without notice. IBM is not responsible for photographic or typographic errors. ***Pricing:** does not include tax or shipping and is subject to change without notice. Reseller prices may vary. **Warranty:** For a copy of applicable product warranties, write to: Warranty Information, P.O. Box 12195, RTP, NC 27709, Attn: Dept JOJA/B203. IBM makes no representation or warranty regarding third-party products or services. **Footnotes:** (1) **Embedded Security Subsystem:** requires software download. (2) **Processor:** With Intel SpeedStep, processor speed may be reduced to conserve battery power. (3) **Wireless:** based on IEEE 802.11a, 802.11b and 802.11g, respectively. An adapter with 11a/b, 11b/g or 11a/b/g can communicate on either or any of these listed formats respectively; the actual connection will be based on the access point to which it connects. (4) **Included software:** may differ from its retail version (if available) and may not include user manuals or all program functionality. License agreements may apply. (5) **Memory:** For PCs without a separate video card, memory supports both system and video. Accessible system memory is up to 64MB less than the amount stated, depending on video mode. (6) **Hard drive:** GB = billion bytes. Accessible capacity is less; up to 4GB is service partition. (7) **Battery:** These model numbers achieved the Ziff Oavis Media, Inc.'s Business Winstone® 2002 BatteryMark™ Version 1.0 Battery Rundown Time of at least the time shown. This test was performed without independent verification by the VeriTest testing division of Lionbridge Technologies, Inc. ("VeriTest") or Ziff Oavis Media, Inc.; neither Ziff Oavis Media, Inc., nor VeriTest makes any representations or warranties as to these test results. Winstone is a registered trademark and BatteryMark is a trademark of Ziff Oavis Publishing Holdings, Inc., in the U.S. and other countries. A description of the environment under which the test was performed is available at ibm.com/pc/www/thinkpad/batterylife. Battery life (and recharge times) will vary based on many factors including screen brightness, applications, features, power management, battery conditioning and other customer preferences. (8) **Travel Weight:** includes battery and optional travel bezel instead of standard optical drive in Ultrabay bay, if applicable; weight may vary due to vendor components, manufacturing process and options. **Thinness:** may vary at certain points on the system. (9A) **Limited warranty:** Support unrelated to a warranty issue may be subject to additional charges.



(Monitor not included)



(Monitor not included)



(Monitor not included)

IBM ThinkCentre™ A50p

Distinctive IBM Innovations:

- Rapid Restore Ultra – Push-of-a-button data backup and recovery

System Features:

- Intel® Pentium® 4 Processor with HT Technology 2.80GHz
- Microsoft Windows XP Professional
- 256MB DDR SDRAM⁵
- 40GB hard drive • CD-RW
- Integrated 10/100 Ethernet
- Norton AntiVirus™ (2003 OEM Edition)
- Lotus® SmartSuite® Millennium license
- 1-yr limited warranty with limited onsite service⁹⁸

\$789 ☐ NavCode 843398U-M224

With Microsoft Office Small Business Edition 2003: \$1,029

ServicePac® Service Upgrade:
2-yr Onsite Repair/9x5/Next Business Day Response
#54P1859 \$75

IBM ThinkCentre A50p

Distinctive IBM Innovations:

- Rapid Restore Ultra – Push-of-a-button data backup and recovery

System Features:

- Intel Pentium 4 Processor with HT Technology 2.80GHz
- Microsoft Windows XP Professional
- 256MB DDR SDRAM
- 40GB hard drive • CD-RW
- Intel Extreme Graphics 2
- Integrated 10/100 Ethernet
- Norton AntiVirus (2003 OEM Edition)
- Lotus SmartSuite Millennium license
- 3-yr parts/1-yr limited onsite service limited warranty⁹⁸

\$859 ☐ NavCode 843298U-M224

With Microsoft Office Small Business Edition 2003: \$1,099

ServicePac® Service Upgrade:
3-yr Onsite Repair/9x5/4-hr Response
#41L2732 \$229

IBM ThinkCentre M50

Distinctive IBM Innovations:

- Rapid Restore Ultra – Push-of-a-button data backup and recovery

System Features:

- Intel Pentium 4 Processor with HT Technology 3.06GHz
- Microsoft Windows XP Professional
- 512MB DDR SDRAM
- 40GB hard drive • CD-ROM
- Integrated 10/100 Ethernet
- Lotus SmartSuite Millennium license
- 3-yr limited warranty with limited onsite service⁹⁸

\$1,029 ☐ NavCode 8189F1U-M224

With Microsoft Office Small Business Edition 2003: \$1,269

ServicePac® Service Upgrade:
4-yr Onsite Repair/9x5/Next Business Day Response
#69P9161 \$89

IBM ThinkCentre M50

Distinctive IBM Innovations:

- Rapid Restore Ultra – Push-of-a-button data backup and recovery
- IBM Embedded Security Subsystem 2.0 – Strongest security as a standard feature

System Features:

- Intel Pentium 4 Processor with HT Technology 3.0GHz
- Microsoft Windows XP Professional
- 512MB DDR SDRAM
- 40GB hard drive • DVD-ROM
- Durable all-steel chassis
- Toolless cover removal
- Gigabit Ethernet-integrated
- Lotus SmartSuite Millennium license
- 3-yr limited warranty with limited onsite service⁹⁸

\$1,069 ☐ NavCode 8187F4U-M224

With Microsoft Office Small Business Edition 2003: \$1,309

ServicePac® Service Upgrade:
3-yr Onsite Repair/24x7/4-hr Response
#41L2740 \$159

IBM ThinkCentre S50

Distinctive IBM Innovations:

- The smallest IBM desktop without compromise: 62% smaller than a standard IBM desktop
- Rapid Restore Ultra – Push-of-a-button data backup and recovery

System Features:

- Intel Pentium 4 Processor with HT Technology 3.06GHz
- Microsoft Windows XP Professional
- 256MB DDR SDRAM
- 40GB hard drive • CD-ROM
- Integrated 10/100 Ethernet
- 3-yr limited warranty with limited onsite service⁹⁸

\$999 ☐ NavCode 818346U-M224

With Microsoft Office Small Business Edition 2003: \$1,239

ServicePac® Service Upgrade:
4-yr Onsite/9x5/4-hr Response
#69P9162 \$250

IBM ThinkCentre S50

Distinctive IBM Innovations:

- Rapid Restore Ultra – Push-of-a-button data backup and recovery
- IBM Embedded Security Subsystem 2.0 – Strongest security as a standard feature

System Features:

- Intel Pentium 4 Processor with HT Technology 3.0GHz
- Microsoft Windows XP Professional
- 512MB DDR SDRAM
- 40GB hard drive • DVD-ROM
- Durable all-steel chassis
- Toolless cover removal
- Gigabit Ethernet-integrated
- 3-yr limited warranty with limited onsite service⁹⁸

\$1,119 ☐ NavCode 818343U-M224

With Microsoft Office Small Business Edition 2003: \$1,359

ServicePac® Service Upgrade:
3-yr Onsite/9x5/4-hr Response
#41L2734 \$129

IBM recommends Microsoft® Windows® XP Professional for Business.

IBM Think Express Program

Select and purchase IBM Think Express products, designed and priced for small and medium businesses.

IBM ThinkPad Accessories

Belkin Components Universal Notebook Travel Surge Protector
#22P7127 \$19.99

Targus Deluxe Mobile Essentials Kit
#22P7437 \$60

ThinkPad Premiere Leather Carrying Case¹³
#10K0209 \$99

ThinkPad 72W AC/DC Combo Adapter
#22P9010 \$99

ThinkPad Port Replicator II
#74P6733 \$179

IBM ThinkCentre Accessories

128MB USB 2.0 High-Speed Memory Key
#22P9229 \$59

Lexmark X6170 All-in-One
#22P9147 \$200

17" (16" vis) E74 CRT Monitor with system purchase
#W9SP4HN \$129

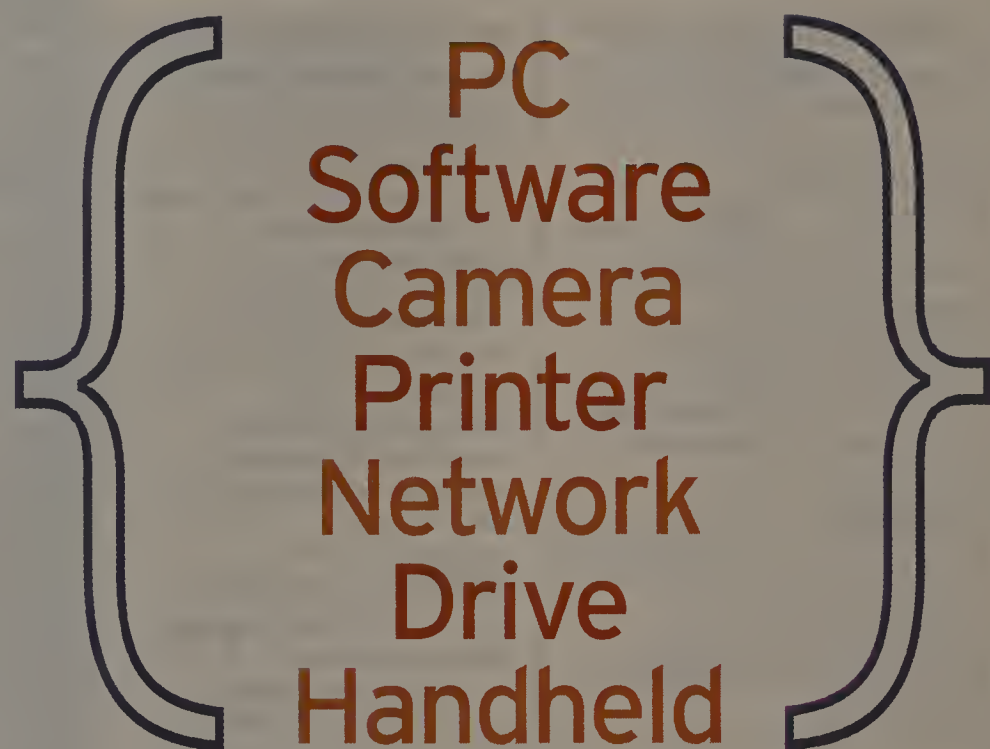


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⁽⁹⁸⁾ Systems with limited onsite service: are designed to be repaired during the applicable warranty period primarily with customer-replaceable parts provided by IBM. IBM will only send a technician onsite to perform a repair if (a) remote telephone diagnosis and/or customer part replacement are unable to resolve the problem, or (b) the part is one of the few designated by IBM for onsite replacement. For a list of onsite replaceable parts, contact IBM. Support unrelated to a warranty issue may be subject to additional charges. ⁽¹⁰⁾ ServicePac Services: are available for machines normally used for business, professional or trade purposes, rather than personal, family or household purposes. Service period begins with the equipment date of purchase. Service levels are response-time objectives and are not guarantees. If the machine problem turns out to be a Customer Replaceable Unit (CRU), IBM will express ship the part to you for quick replacement. Onsite 24x7x2-hour service is not available in all locations. For ThinkPad notebooks requiring LCD or other component replacement, IBM may choose to perform service at the depot repair center. ⁽¹¹⁾ Shipping: Standard shipping included when you order online, U.S. only. ⁽¹²⁾ Wireless capability: requires compatible wireless-enabled options, sold separately. ⁽¹³⁾ Certain IBM logo products: are not manufactured, warranted or supported by IBM; IBM logos and trademarks used under license. Contact IBM for details. ⁽¹⁴⁾ Microsoft Office XP: Certain Microsoft software product(s) included with this computer may use technological measures for copy protection. IN SUCH EVENT, YOU WILL NOT BE ABLE TO USE THE PRODUCT IF YOU DO NOT FULLY COMPLY WITH THE PRODUCT ACTIVATION PROCEDURES. Product activation procedures and Microsoft's privacy policy will be detailed during initial launch of the product, or upon certain reinstallations of the software product(s) or reconfigurations of the computer, and may be completed by Internet or telephone (toll charges may apply). ⁽¹⁵⁾ Battery Life: Based on manufacturer's published figures or CNET.com results for the top 5 vendors in 2003 notebook sales, as of 1/29/2004. ⁽¹⁶⁾ Full-size keyboard: As defined by ISO/IEC 15412. Trademarks: The following are trademarks or registered trademarks of IBM Corporation: IBM, the IBM logo, ThinkPad, Ultrabay and UltraNav. Microsoft and Windows are registered trademarks of Microsoft Corporation. Intel, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Intel SpeedStep and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Other company, product and service names may be trademarks or service marks of other companies. © 2004 IBM Corporation. All rights reserved. Visit www.ibm.com/pcc/safecomputing periodically for the latest information on safe and effective computing.

Who Knew Your...



...Could Do That?

28 UNEXPECTED WAYS TO GET MORE OUT OF
THE TOOLS YOU USE EVERY DAY. By Steve Bass

MY WIFE, JUDY, THINKS I'M CRAZY. (I prefer "nonconformist," thank you very much.) And why? Just because I take pleasure in discovering new and unexpected ways to use my favorite hardware and software. Exhibit A: I recently spent a week holed up in my home office poking around my PC. Let me tell you, I found some things I never expected.

Like, for instance, an easy way to strip out the information hidden in Office documents, a neat trick for speeding up the Internet, and a simple

Windows tweak that boosts the performance of my hard drive. I also transformed my notebook into a desktop PC, established a wireless connection for my printer, and loaded images directly from my digital camera into a slide-show display that hangs on my living-room wall. I also unearthed a bunch of low-cost gizmos and free software that can help your current setup do more than you ever thought it could. I bet you're going to be more than a little surprised at these fab tricks, tweaks, and tips. ►





{ PCs and Notebooks }

...YOUR USB GADGETS COULD CONNECT VIA AN ORDINARY WALL SOCKET? Are you running out of space in your geekosphere? Here's a thought: Relocate your USB printer or other peripheral down the hall—or at the other end of your home. The only equipment you need is Belkin's PowerLine USB Adapter (\$65 street; www.belkin.com). Simply plug the adapter into your computer, and then plug the adapter into any electrical wall socket. Connect the Belkin PowerLine Ethernet Adapter (another \$100) to your computer or network, and plug it into a wall socket, too. PowerLine networking even works with versions of Windows as far back as 98 SE.

...YOUR PRINTER COULD GO WIRELESS? There's no getting around the convenience of wireless devices. Still, even if you're a big wireless fan, you probably have at least one device that remains tethered to your PC: your printer. But now you can cut that cord, too. All it takes is a wireless print server. The Linksys Instant Wireless Print Server WPS11 uses the 802.11b standard and supports one parallel printer; the company's Wireless G Print Server WPS54GU2 is designed for 802.11g networks and supports two printers (one parallel and one USB). Either model can connect to your network via ethernet or wirelessly, and each costs about \$130 (www.linksys.com).

...YOU COULD PLUG YOUR DIGITAL CAMERA STRAIGHT INTO A SLIDE-SHOW DISPLAY? If you're like me, you love showing off your digital-camera handiwork, but you don't want to gather everyone around your PC monitor to view the images. With Pacific Digital's MemoryFrame MF-570 (www.pacificdigital.com), you can skip the PC altogether. Your shots go straight from the camera to this 5.6-inch active-matrix LCD that can hang on your living-room wall or rest on a table or desktop. Load up to 55 images (.jpeg, .tiff, .png, .gif, or .bmp) via USB into the device's 16MB of RAM and 8MB of flash memory. The bundled Digital Pix Master software lets you use your PC to create a slide show and then load the images from the PC into the MemoryFrame. But letting the device create the show for you is even more convenient.



Its built-in controls enable you to delete images, change timing and transitions, and make other alterations to your slide shows. I do have a few quibbles about the MemoryFrame, though: The device uses a slow USB 1.1 connection, and the wire that leads to the AC adapter is a glaring eyesore. Oh, and then there's the price tag: At \$350 list and \$270 street, the MemoryFrame isn't cheap (the new 8-by-10-inch model lists for \$500). Still, there's just no getting around the fact that

this little puppy wows everyone who ventures into my living room.

...YOUR NOTEBOOK SCREEN COULD DOUBLE AS A DESKTOP MONITOR? If you're looking to go the single-machine route, you'll be interested in the Oyster from Sherpaq Mobile Products (www.oysterdock.com), a smart way to convert your notebook into a desktop. Open your notebook flat and slide the keyboard end into this \$150 almost-vertical docking station—and just like that, the notebook's display is facing you at the level of a desktop monitor. Connect your mouse, desktop keyboard, and other peripherals to the Oyster's USB ports (the gizmo includes a four-port USB 2.0 hub with a spot to hide the cables), and the transformation is complete.



...YOUR INKJET CARTRIDGES WOULD LAST LONGER WITH REGULAR USE? If you're one of those happy souls who don't use their inkjet printer more than once a month or so, keep in mind that its ink cartridges can get funky and its print quality can plummet. I gave my inkjet a long break, and the first photo I printed afterward showed blue roses on a red sky. To keep your printer in shape, print a test color document once a week. To discover more ways to cut your printer costs, see April's "Cheapskate's Guide to Printing" (find.pcworld.com/41792).

...YOUR PC COULD CATALOG YOUR CDS AND DVD MOVIES AUTOMATICALLY?

It used to take me forever to decide on a movie to watch or music to listen to from my scattered collection of DVDs and CDs. I spend less time scrambling and more time enjoying since I found a couple of great cataloging programs. For movie DVDs, grab a copy of DVD Profiler. Enter the UPC on a movie DVD's case into the \$25 program, or just stick the disc into your PC, and the software retrieves more than 20 details about the movie from an online database. DVD Profiler stores the data for easy lookups, too. Browse to find.pcworld.com/41794 to download the trial version. Keep tabs on your music CDs and MP3s with CD Trustee, which creates a database of song titles automatically. Visit find.pcworld.com/41798 for a trial version of the \$40 program.

Bonus tip: Now you can wake up from your office catnaps to whatever MP3 or WMA music file you prefer. Jake's Alarm Clock freeware puts a small clock on your desktop that you can set to play the tune of your choice at the time you specify. Browse to find.pcworld.com/42064 to download your copy of the program.

WHO KNEW?

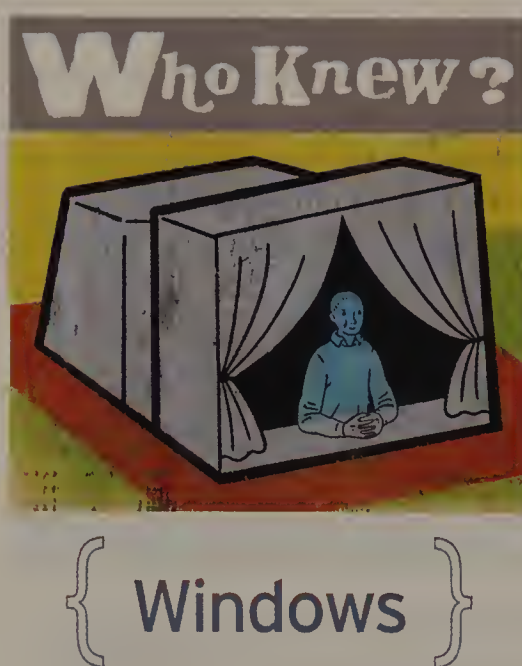
Digital Cameras in the Dark

...YOU COULD BRIGHTEN YOUR OUTDOOR NIGHT SHOTS?

Capturing adequately lit and detailed photos after sunset is always a challenge. But a few tricks can help you achieve better-looking night scenes. If your camera offers it, choose the *Night Mode* setting. If your model does not have that setting but does have some basic manual features, navigate the camera's menu and change the ISO to the highest possible setting—for example, to 400 or 800. Now adjust the aperture to the lowest number, which typically is f/2.8, and reduce the shutter speed to 1/60 of a second or so. Turn off the flash and mount the camera on a tripod to eliminate movement. If you don't have a tripod, prop the camera against a flat, stationary object such as a table, a bench, or a ledge.



—Grace Aquino



...YOU COULD KEEP WINDOWS UPDATE FROM LISTING USELESS DOWNLOADS?

Windows XP's automatic updates are great, but the Windows Update site lists more downloads than I'll ever need. On my update page, the space-wasters are MovieMaker 2 and dozens of foreign-language fonts. Customizing the page to get rid of these and other unwanted entries takes no time at all. To get to the Windows Update page in XP, click *Start•Help and Support*, and choose *Keep your computer up-to-date with Windows Update*

under 'Pick a task'. To get there in Internet Explorer, select *Tools•Windows Update*. Once you reach the update page, click *Scan for updates*. When the scan finishes, select *Personalize Windows Update* under 'Other tasks' in the left pane, uncheck the categories and updates you no longer want to see, and click *Save Settings*.

...YOU COULD SET WINDOWS TO LOAD JUST THE HARDWARE DRIVERS YOU NEED RIGHT NOW?

Anybody who has owned a notebook computer for a while probably knows that Windows lets you boot with different hardware profiles. Using profiles can help conserve system resources and can force your machine to boot faster. For example, you can create one profile that disables your network adapter or modem when you're on a plane, and another that recognizes your network adapter, external DVD player, and other devices when the notebook is docked at home. Why not carry this over to your desktop? If you sometimes perform heavy-duty video editing, set up a profile that doesn't load drivers for your CD drive and for other hardware you won't need. This way your system can focus on the task at hand.

To create a hardware profile in Windows XP and 2000, right-click *My Computer*, select *Properties*, and click *Hardware•Hardware Profiles*. In Windows Me and 98, right-click *My Computer*, choose *Properties*, and click *Hardware Profiles*. If you've never created a profile, the only listing under 'Available hardware profiles' will be 'Original Configuration' or 'Original Configuration (Current)', depending on your version of Windows. Otherwise, your current profile will be highlighted. Click *Copy*, type a name for your new hardware profile, and click *OK*. Other options in this dialog box let you choose a profile when Windows boots, or use the first profile if you don't select one. When you're done, click *OK* again, choose *Device Manager*, and disable the devices you won't need for your new profile. Now simply log on with the hardware profile that uses only the devices you'll need. ►

...YOU COULD IMPROVE YOUR HARD DRIVE'S PERFORMANCE AND SECURITY BY SWITCHING TO NTFS? If you've upgraded your system from an older version of Windows to XP, there's a good chance that your hard drive still uses the old operating system's FAT32 file structure. You can boost your drive's performance and reliability by converting

to NTFS (short for NT File System). NTFS permits you to save files larger than FAT32's 4GB limit, and it lets you encrypt folders for added security. Better still, NTFS uses a smaller cluster size, which translates into less wasted storage space—so you'll get more drive bang for your buck. Keep in mind, however, that you won't notice any performance boost

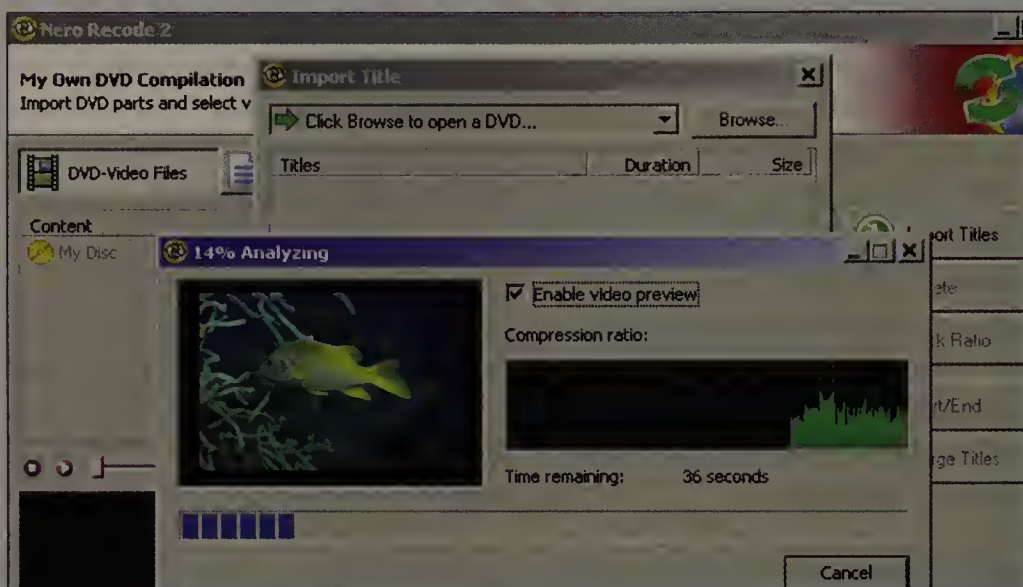
with NTFS if your hard drive is smaller than 10GB or if it runs at 5400 rpm.

To convert a FAT32 drive to NTFS, click **Start•Run**, type **cmd**, and in the command prompt window, enter **convert drive letter:/fs:ntfs**, where *drive letter* is the appropriate letter for the drive in your PC. For instance, if you want to convert your C: drive, type **convert c:/fs:ntfs** (don't forget the spaces before the driver letter and before the forward slash).

One peril to watch out for: Once you convert the drive to NTFS, you'll have to use a third-party program, such as Symantec's PartitionMagic 8, to return the drive to FAT32 format.

WHO KNEW?

Double Your DVD Storage



PUT THE WHOLE SHOW ON one DVD or CD disc by removing some MPEG-2 information.

...YOU COULD FIT MORE HIGH-QUALITY VIDEO ON A SINGLE DVD DISC?

Hollywood can do it, so why can't you? Commercial video releases squeeze a 2-hour movie onto a single DVD, but your video burning software says that you can record only 1 hour of MPEG-2 video on a disc at the maximum quality setting. The movie studios use DVD-9 media, dual-layer discs that each take 8.5GB of data. Dual-layer drives are trickling to the masses late this spring: New devices from HP, Philips, and Sony that let you pack 2 hours of Hollywood-quality video on a disc cost only about \$50 more than a standard DVD burner. If you're not ready for a new drive, however, there's another way to put more video onto a DVD or CD without sacrificing too much quality.

Ahead's Nero 6 Ultra Edition, the freeware DVD Shrink, 321 Studios' DVDXtreme, InterVideo's DVD Copy, Roxio's Easy Media Creator 7, and other burning software shrink non-copy-protected DVD movies onto a single DVD by stripping information from the MPEG-2 video, reducing file size by about half. Ahead's ReCode can generate MPEG-4 movies only from a DVD's .vob video files, stored either on a disc or on a hard drive. Roxio's software can create DivX MPEG-4 movies from any video imported through VideoWave (part of Easy Media Creator) but not from another DVD. Putting 2 hours of MPEG-4 video on two CDs (or nearly 7 hours on a DVD) won't cause any pixelation or "blocking" of the image (also known as "artifacting"). Compressing the video to a single CD causes some artifacting, but the picture is better than with the MPEG-1 Video CD format. The catch: To play back video, you'll need MPEG-4- or DivX-enabled software. A few DVD players and handheld video devices support these formats, too. —Melissa J. Perenson

...YOU COULD DIVIDE TO CONQUER YOUR VIDEO FILE WOES?

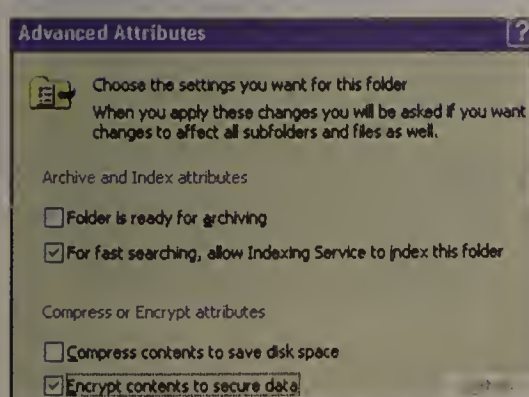
People posting video on the Internet often split their productions into dozens of individual files to make them easier to upload and download. Of course, you could watch each of them separately, but it's far more rewarding to view the whole video continuously. Fear not, auteurs, Boilsoft's \$20 AVI/MPEG/RM/WMV Joiner and \$25 AVI/MPEG/ASF/WMV Splitter can handle all of your video splicing needs, lickety-split. Both of these utilities take an infinitesimal amount of skill to operate—even a video newbie can get it right the first time. Simply add the files you want to merge, and then click one button. Splitting a large file is just as easy: Locate it, decide on a file size (or choose selected portions of the video), and click a button. Go to find.pcworld.com/41800 to download trial versions of the programs. And visit www.boilsoft.com to inspect the vendor's tools for converting Windows Media and Real Media files to AVI or MPEG format.

...YOU COULD STORE NOTES WITH FILES IN WINDOWS?

Windows' file-annotation function may be unpolished, but it does give PC users a quick and easy way to add notes to important files. To annotate a file in Windows Explorer, right-click the file and choose *Properties* (or select the file and press **<Alt>-<Enter>**).

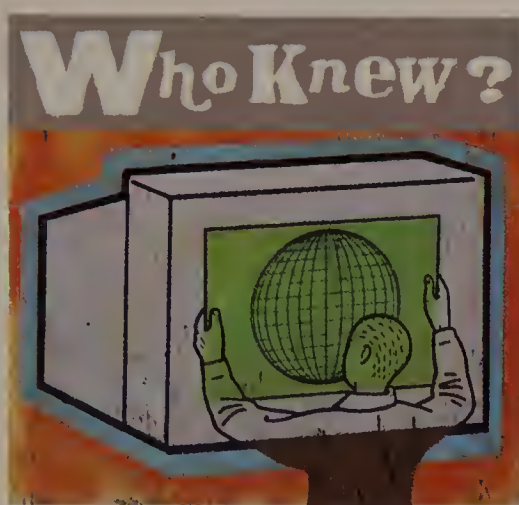
Choose the *Summary* tab (Windows XP) or the *Custom* tab (all other versions of Windows), and type your note in the Comments field or any other blank field. Strangely enough, this option is unavailable for certain file types, including some video formats. (If you don't see any blank fields under the Summary tab, click the *Simple* button.) Now whenever you send the file to someone, your annotations will travel along with it.

...WINDOWS COULD MAKE IT SO EASY TO SAFEGUARD FILES? Even if you trust your friends, family, and coworkers, it's still worth encrypting your sensitive files on multiuser systems to shield them from nosy bosses and other snoops. To protect files in Windows XP Pro and 2000 (with an NTFS-formatted drive), open Windows Explorer and right-click the folder you want to encrypt. Choose *Properties*, click the *Advanced* button, and check the box next to *Encrypt contents to secure data*. Click *OK* twice; and just like that, the folder's contents are locked up tight as a drum. Any files that you move to the folder subsequently will be encrypted as well. If you use Windows Me, browse to find.pcworld.com/41802 to read Scott Dunn's July 2003 *Windows Tips*



DRAW AND DROP FILES TO AN encrypted folder to safeguard them automatically.

column, "Password-Protect Your Sensitive Files and Folders." Or visit find.pcworld.com/41804 to get the free Cryptainer LE utility, which creates a hidden, encrypted virtual drive. To keep your PC single-user, go to find.pcworld.com/42066 and read February's *Answer Line* column, "How Do I Keep People Off My PC?"



{ Internet }

...A USB GIZMO COULD START YOUR INTERNET CONNECTION THE WAY A KEY STARTS YOUR CAR? From time to time, most people share their PC with somebody, whether a family member at home or a colleague at work. You probably have files and folders that you'd like to keep private, or maybe you want to limit your child's Internet access. Griffin Technologies' ControlKey enables you to do this safely and easily (www.controlkey.com). The \$60 USB device can be configured to work in several different ways: Simply by pulling the device from the port it occupies, you can lock your PC, put your machine in standby mode, or block the system's Internet access. ControlKey also prevents the hacker trick of booting your system into Safe Mode. ControlKey works only with Windows XP, and it can lock up files and folders only on NTFS-formatted drives.

...YOU COULD BOOST YOUR INTERNET CONNECTION SPEED BY TWEAKING YOUR PC'S REGISTRY? No matter how you connect to the Internet, grabbing a little extra speed is always good. One cool way to goose your connection—whether dial-up or broadband—is to use the free CableNut utility to fine-tune the Internet settings in the Windows Registry. Browse over to find.pcworld.com/41806 to download this program. After you install

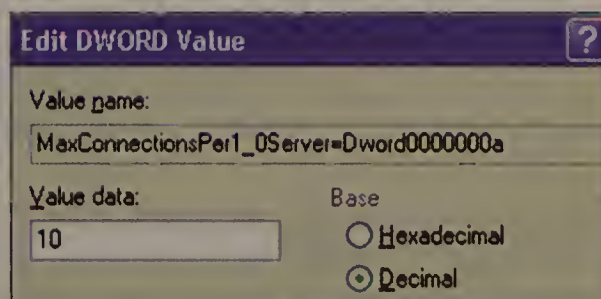
CableNut, use its Registry backup feature to create a copy of the Registry, for insurance. With the backup in place, choose the profile that matches the way you connect to the Internet; then save the settings and reboot your PC. I noticed a moderate improvement in the DSL speed of my XP system, and a significant boost when I used dial-up on a Windows 98 PC. Fair warning: Choosing the right profile is important; so before you get started, visit find.pcworld.com/41808 and read CableNut's Help file.

...YOU COULD DOWNLOAD MORE THAN TWO THINGS AT A TIME IN INTERNET EXPLORER? You may be getting less than you have coming to you when you download in Internet Explorer. For some reason, IE limits you by default to two



simultaneous downloads (crazy, I know, especially if you have a high-speed Internet connection). To increase the number of IE download streams in Windows XP, first click *Start•Run*, type **regedit**, and press **<Enter>** to open Windows' Registry. In the left pane, navigate to the following key (Registry-speak for folder): *HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Internet Settings*.

For safety's sake, back up this key before you proceed: Right-click it and select *Export*; then choose the folder that you



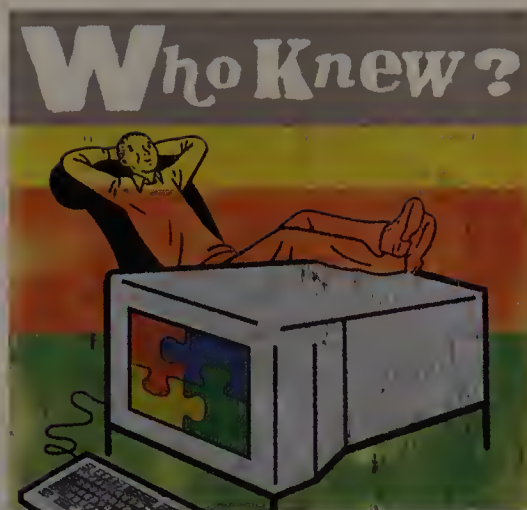
INCREASE THE NUMBER OF simultaneous downloads in IE by adding this Registry key.

store your backups in, give the file a name like 'IE Registry Backup', and click *Save*. Now you're ready to start tinkering with the Registry settings. Choose *Edit•New•DWORD Value*, type **MaxConnectionsPer1_0Server=Dword:0000000a**, and press **<Enter>**. Right-click the new entry, choose *Modify*, check the *Decimal* radio button, enter **10** under 'Value data', and click *OK*. Repeat these steps to create a DWORD Value in the same key named **MaxConnectionsPerServer=Dword:0000000a** with the same settings as the first one you created, and close the Registry.

...YOU COULD SHARE FILES WITHOUT USING E-MAIL OR FTP?

Have you ever wished you could move files to a folder on your PC and have your friends see them on their PCs almost instantly? Well, wish no longer. FolderShare—a free, secure peer-to-peer file-sharing program—is so convenient that I use it almost daily. Here's how it works: Start by inviting one or more people to share a specific library. The invitation asks them to download a small application that will let them "connect" to the library. They then associate a folder on their computer with the library and download any of the library's files to their local machine via drag-and-drop in Windows Explorer. The free version of FolderShare allows you to queue up to three files for download. You can work with as many as 100 libraries, each of which may hold up to 3000 files (the maximum size of any single file is 2GB). For \$4.50 per month, you gain the ability to automatically sync files. FolderShare is an ideal way to bypass e-mail and FTP servers when you want to share big files. Visit find.pcworld.com/41810 to download your copy (registration is required). And go to find.pcworld.com/41814 to read my *Home Office* column from last July, "Move Big Files Without Breaking a Sweat."

Bonus tip: Still moving your files the old-fashioned way? Go to find.pcworld.com/42068 to download HJSplit, a free utility that lets you span big files across several CDs, floppies, or other media.



{ Office Apps }

...YOU COULD MAKE YOUR OFFICE DOCUMENTS SLEEKER AND SAFER BY REMOVING HIDDEN INFORMATION? Whenever you save a Word, Excel, or

PowerPoint document in Office XP or 2003, you save all sorts of personal baggage along with it, including Smart Tags, hidden text, a list of everyone who worked on the document, and all of their comments. Visit find.pcworld.com/41824 to download a free Office add-in from Microsoft that removes the data. Close all your Office apps before installing the tool. When you reopen them, you will see a new entry on the File menu: Remove Hidden Data.

Bonus tip: To save Word files in which all your tracked changes, comments, and personal data have been stripped out, select *Tools•Options•Security* and make sure that both 'Warn before printing, saving, or sending a file that contains tracked changes or comments' and 'Remove personal information from this file on ►

WHO KNEW?

PDAs Make Music, Backups

...YOU COULD LISTEN TO FM RADIO ON YOUR PDA?

Most PDAs can play MP3 music tracks and record voice memos; but when it comes to audio, that's about it. Fortunately, PDA expansion ports (CompactFlash or SD on Pocket PCs and Palms) expand your entertainment versatility. For example, you can transform any Palm or Pocket PC into an FM radio by using the IBiz PocketRadio (www.ibizpda.com). This handy gizmo (\$40 street) lets you listen to FM stations while performing other tasks. Load the IBiz software onto your handheld and slip the device into the PDA's expansion slot. The included earpieces or your own headphones serve as the radio's antenna, providing surprisingly good reception. You get 18 station presets along with basic radio controls. Once the radio is on, you can easily switch to work with other applications and play the radio broadcast in the background.



...YOU COULD BACK UP YOUR PDA WITHOUT HAVING TO USE A PC?

In the past, if your PDA's memory went south and you were nowhere near the PC that you synced it with, you were in big trouble. That's because, until recently, the only place you could back up a PDA was on the computer it shared information with. But not anymore. The Secure File Backup from MDM (www.gomdm.com) is a \$50, 64MB SD card for Palms and Pocket PCs that automatically launches the backup or restore program each time you insert it. The card intuitively backs up fully or incrementally; if you lose your data, just put the card in the PDA to retrieve it instantly. The card's generous 64MB of memory can accommodate everything stored on any current Palm or Pocket PC. —Michael S. Lasky

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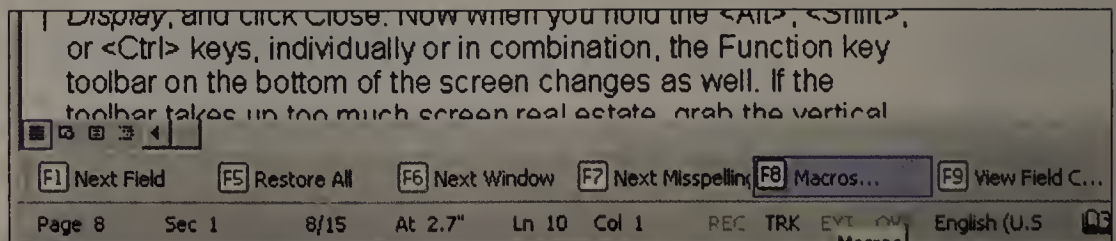
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save' are checked. Note that this option doesn't remove as much hidden information as Microsoft's Office add-in does.

...WORD COULD REMIND YOU ABOUT WHAT ITS FUNCTION KEYS DO? I'm a big fan of keyboard shortcuts, but I have a heck of a time remembering all but the most basic combinations. At least I've got some help when it comes to figuring out Word's function keys, and it's from an unlikely source: the program itself. In all versions since Word 2000, you have instant access to an on-screen display of all



GET A CLUE ABOUT WORD'S FUNCTION keys by adding this toolbar below your documents.

of its function-key combinations—and the program has dozens. Choose *Tools•Customize•Toolbars*, scroll to and select *Function Key Display*, and click *Close*. From then on, whenever you hold down the <Alt>, <Shift>, or <Ctrl> keys on your

keyboard—either individually or in combination—the function key toolbar options on the bottom of the screen change as well. If the toolbar takes up too much screen real estate, simply grab the vertical bar at the left end and drag it to another location on the page.

Bonus tip: Every time you type text into an Excel cell (for a label or heading, for example), it shows as one long string of characters. To get a new line, press <Alt>-<Enter>. When you're done, press <Enter> again to close the cell.

WHO KNEW?

Make Calls the Way You Get MP3s

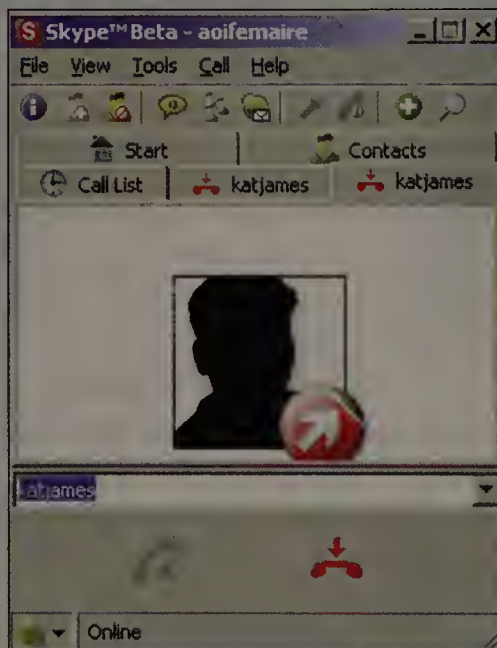
...YOUR BROADBAND LINK COULD REPLACE YOUR PHONE COMPANY?

A great way to get even more out of your broadband or dial-up connection is to do your long-distance yakking over the Internet. While you probably know about Voice-over-IP (VoIP) services, you probably didn't know that you can also make phone calls using your PC over a peer-to-peer network just like Kazaa.

To make peer-to-peer calls, try Skype (www.skype.com), a service (now in beta) that has the built-in disadvantage of permitting you to call only other Skype users' PCs. First, install the software (it's about a 7MB download). Then plug in your PC microphone or a headset and use the program's friendly interface to initiate a call. The audio quality at dial-up speeds is impressive, and it's even better when you're talking over a high-speed connection. At press time Skype rolled out PocketSkype, another beta service that allows you to make free calls on any Wi-Fi-enabled Pocket PC-based handheld. Various other software-based IP phone services charge a fee for calls to landline numbers and cell phones. One such service is Callserve Internet Telephone (www.callserve.com). The quality of the calls on these services is very good, but you must pay for your calls in advance; prepaid plans start at \$15.

If you don't like headsets or PC microphones—and don't want to have to turn on your PC to place a call—consider a hardware-based IP phone service (a broadband connection and a router are required). The adapters provided by VoicePulse (www.voicepulse.com) and Vonage (www.vonage.com) plug into your router and any standard phone. The services' call quality is excellent. Fees start at \$15 for 500 minutes. Visit find.pcworld.com/41714 for our May review of hardware-based services.

—Aoife M. McEvoy



THE SKYPE SERVICE LETS you phone other Skype users whether you use a dial-up Net connection or a high-speed one.

...YOU COULD ZIP FILE ATTACHMENTS IN OUTLOOK AUTOMATICALLY? Believe it or not, many of my computing buddies are still on dial-up. (I can't decide whether they're cheapskates or they're just not in any hurry.) To avoid losing their friendship, I compress big files before attaching them to the e-mail messages I send their way. A great tool for this is BxAutoZip, a free Outlook add-in that compresses e-mail attachments with one click. Remember, however, that if your recipients don't have an unzipping program installed on their system, you'll have to use BxAutoZip's self-extracting archive option. The program works with versions of Windows from 95 through XP, and it's compatible with all flavors of Outlook. (A version for Outlook Express should be available by the time you read this.) Browse to find.pcworld.com/41826 to download the add-in. ■

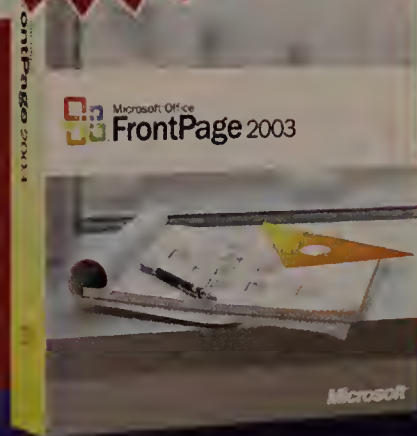
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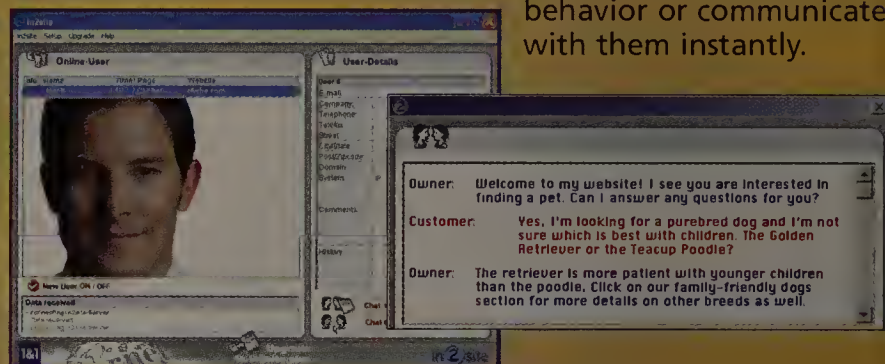
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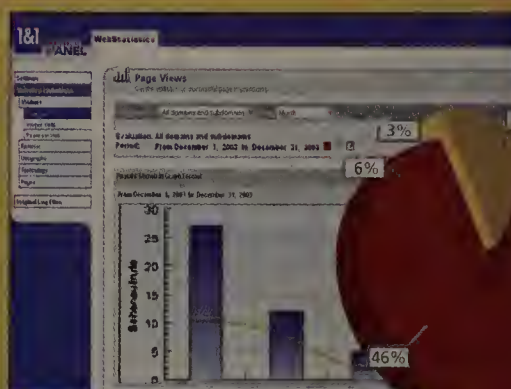
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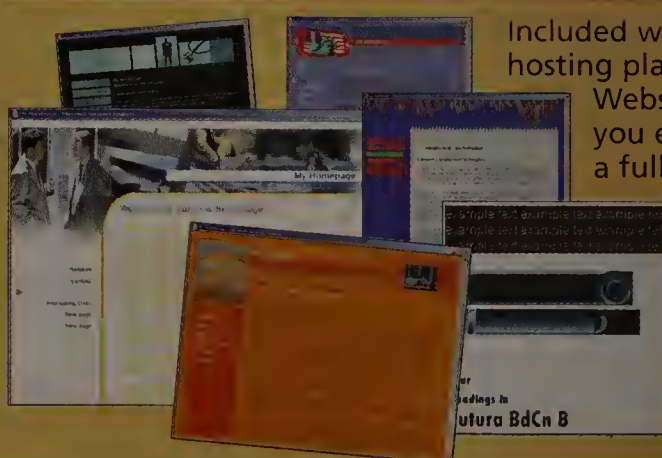
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• Subdomains	5	5

WEBSITE/CONNECTIVITY

• Web space	500 MB	500 MB
• FTP accounts, unlimited access	1	1
• Included bandwidth/month	5 GB	5 GB
• Protected by up-to-date firewall	✓	✓
• Daily backups	✓	✓

APPLICATIONS

• 1&1 Control Panel	✓	✓
• WebsiteCreator	12 pgs	12 pgs
• Full version software worth \$550	✓	✓
• Frontpage 2003	–	✓

E-MAIL

• POP3 e-mail accounts	50	50
• Aliases, auto-responders, forwarding	✓	✓
• 1&1 WebMail	✓	✓
• Included virus scanner	1 POP3	1 POP3

WEBSITE FEATURES

• Logfiles	✓	✓
• CGI library (counter, guestbook, etc...)	✓	✓
• FrontPage 2002 extensions	✓	✓
• Password protected directories	✓	✓

CRM/E-COMMERCE

• 1&1 WebStatistics	✓	✓
• 1&1 Chat channel	1	–
• Customizable forums	✓	✓

EXPRESS SUPPORT

• 24/7 support by phone and e-mail	✓	✓
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BUSINESS PACKAGE

\$9⁹⁹
PER MONTH

INCLUDES 3 DOMAINS

DOMAIN NAMES

• Included domains at no additional cost	3	3
• Manage unlimited domains with one account	✓	✓
• Point external domains to 1&1	100	100
• Subdomains	50	50

WEBSITE/CONNECTIVITY

• Web space	1000 MB	1000 MB
• FTP accounts, unlimited access	5	5
• Included bandwidth/month	15 GB	15 GB
• Protected by up-to-date firewall	✓	✓
• Daily backups	✓	✓

APPLICATIONS

• 1&1 Control Panel	✓	✓
• WebsiteCreator	12 pgs	12 pgs
• Full version software worth \$550	✓	✓
• Frontpage 2003	–	✓

E-MAIL

• POP3 e-mail accounts	150	150
• Aliases, auto-responders, forwarding	✓	✓
• 1&1 WebMail	✓	✓
• Included virus scanner	3 POP3	3 POP3

WEBSITE FEATURES

• Logfiles	✓	✓
• CGI library (counter, guestbook, etc...)	✓	✓
• FrontPage 2002 extensions	✓	✓
• Advanced password protection	✓	✓
• Perl, PHP3 and PHP4	✓	–
• Database	1 MySQL	MS Access
• SSH shell access	✓	–
• SSI (Server side includes)	✓	✓
• Cron Jobs / Scheduled Tasks	✓	✓
• Directory Protection	✓	✓
• Shared SSL	✓	✓
• Active Server Pages	–	✓

CRM/E-COMMERCE

• 1&1 WebStatistics	✓	✓
• 1&1 Chat channels	5	–
• Customizable forums	✓	✓
• in2site Live Dialogue	✓	✓
• Newsletter Tool	✓	✓
• 1&1 WebDatabase	✓	✓
• 1&1 WebElements - Sophisticated Form Editor	✓	✓

EXPRESS SUPPORT

• 24/7 support by phone and e-mail	✓	✓
------------------------------------	---	---

DEVELOPER PACKAGE

\$19⁹⁹
PER MONTH

INCLUDES 5 DOMAINS

DOMAIN NAMES

• Included domains at no additional cost	5	5
• Manage unlimited domains with one account	✓	✓
• Point external domains to 1&1	200	200
• Subdomains	200	200

WEBSITE/CONNECTIVITY

• Web space	2000 MB	2000 MB
• FTP accounts, unlimited access	25	25
• Included bandwidth/month	30 GB	30 GB
• Protected by up-to-date firewall	✓	✓
• Daily backups	✓	✓

APPLICATIONS

• 1&1 Control Panel	✓	✓
• WebsiteCreator	25 pgs	25 pgs
• Full version software worth \$550	✓	✓
• Frontpage 2003	–	✓

E-MAIL

• POP3 e-mail accounts	300	300
• Aliases, auto-responders, forwarding	✓	✓
• 1&1 WebMail	✓	✓
• Included virus scanner	6 POP3	6 POP3

WEBSITE FEATURES

• Logfiles	✓	✓
• CGI library (counter, guestbook, etc...)	✓	✓
• FrontPage 2002 extensions	✓	✓
• Advanced password protection	✓	✓
• Perl, PHP3 and PHP4	✓	–
• Database	3 MySQL	MS Access
• MS SQL	–	✓
• SSH shell access	–	–
• SSI (Server side includes)	✓	✓
• Cron Jobs / Scheduled Tasks	✓	✓
• Advanced developer tools	✓	–
• Dedicated SSL Certificate	✓	✓
• ASP, ASP.NET, .NET Framework	–	✓

CRM/E-COMMERCE

• 1&1 WebStatistics	✓	✓
• 1&1 Chat channels	10	–
• Customizable forums	✓	✓
• in2site Live Dialogue	✓	✓
• Newsletter Tool	✓	✓
• 1&1 WebDatabase	✓	✓
• 1&1 WebElements - Sophisticated Form Editor	✓	✓

EXPRESS SUPPORT

• 24/7 support by phone and e-mail	✓	✓
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– Linux packages – Microsoft packages

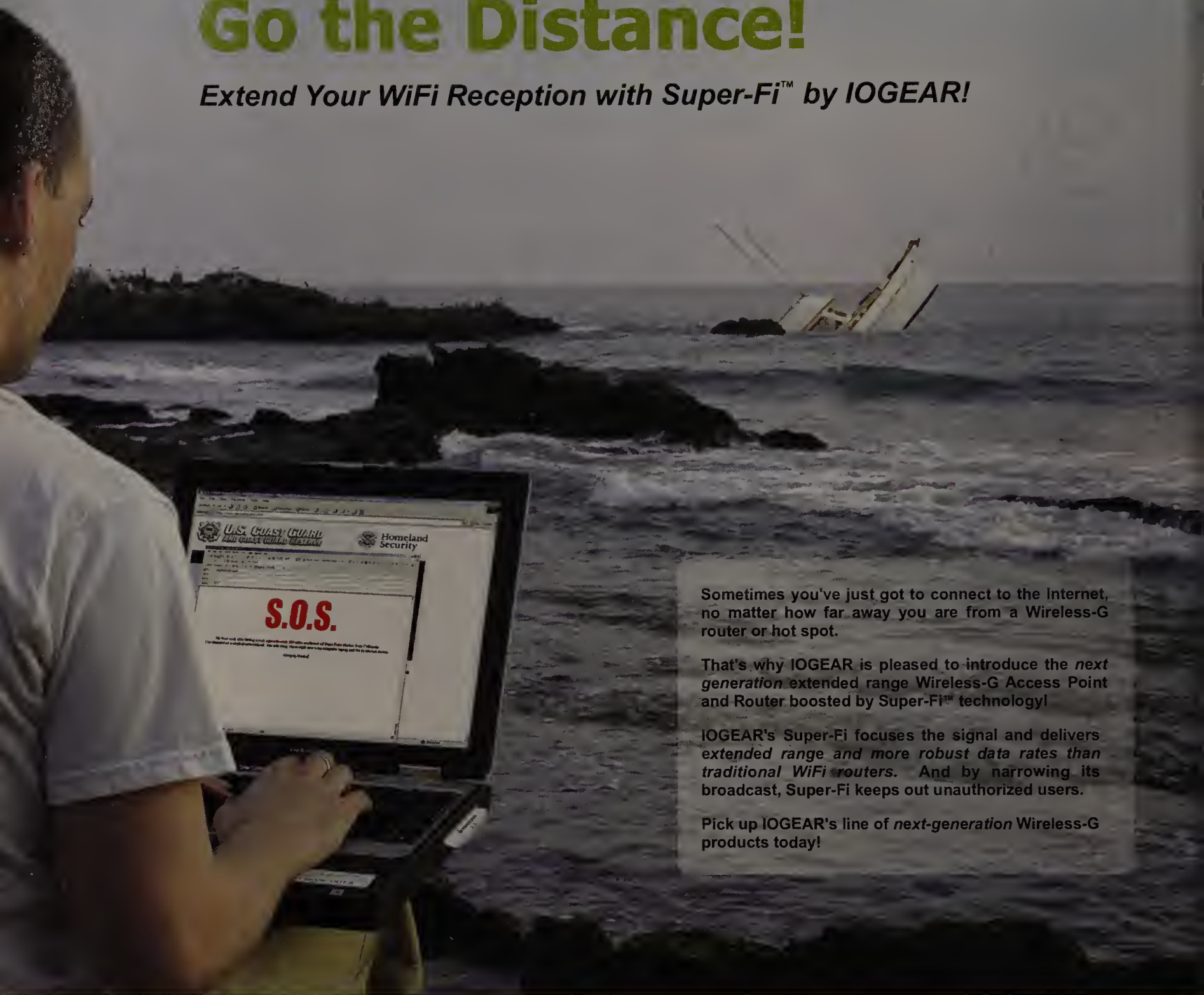
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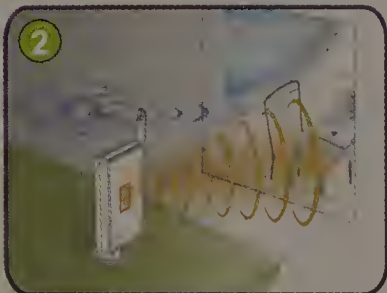
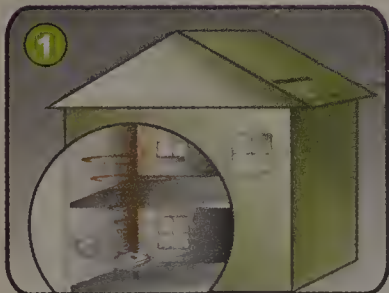


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BY BRYAN HASTINGS

DV Stars

HELLO, HOLLYWOOD!



The latest digital camcorders make spectacular video more affordable and portable than ever.

WITH THE NEW BREED of digital camcorders, making your own movies has never been cheaper or easier, so it's next stop, Sundance. Whether you are filming an independent movie, a sales meeting, or a family barbecue, these new camcorders make shooting your video as simple as writing an Oscar accep-

tance speech. And it's easy to copy that digital video to your PC, where you can edit it and then burn it to DVD to send to your friends, colleagues, or family.

Although most of the camcorders we review here use the widely available MiniDV tapes, two of the models use other storage types: The Sony DCR- ►

Best Cams

**Best
BUY**

FOR THOSE WHO WANT value more than features, **Sony's \$450 DCR-HC20** (right) is a light, uncluttered camcorder that provides you with the basics (like a decent zoom lens and a comfortable hand grip) and is extremely easy to use. For people who want better-looking video and more control, and who don't mind paying more, **Panasonic's \$950 PV-DV953** (left) provides excellent video quality, long battery life, and a set of advanced features to make shooting video easier.



DVD300 records video to an 8-centimeter mini-DVD disc, while the diminutive Sony DCR-IP1 uses tiny MicroMV tapes.

We tested nine models costing between \$350 and \$1000. The PC World Test Center put them through their paces, testing battery life and video quality for indoor, outdoor, and low-light indoor settings.

All of the units shot good-quality video in outdoor and well-lit indoor venues: The variations we saw in our video tests on the 30-inch LCD TV we used were subtle. We rated the Panasonic PV-DV953 as having the best, most accurate video overall.

Our battery-life tests revealed that all of the camcorders were adequate for casual

shooting, although you should think about investing in higher-capacity or spare batteries. Want to make your unit's batteries last longer? Use the viewfinder instead of the LCD panel when possible.

These camcorders vary greatly in design and ease of use, and especially in how comfortable they are to hold and operate. Panasonic's PV-DV953, while heavy, was a pleasure to record with; but its lighter sibling, the PV-DV73, was uncomfortable to hold for long stretches and had an awkward menu-key placement.

Vendors often quote the digital zoom that their cams offer; this feature is not ideal because it enlarges a part of the image, often producing horribly grainy video. Look for optical zoom instead.

All camcorders offer the same basic features, but advanced features vary widely. For instance, while the cams all come

FEATURES COMPARISON

**TEST
Center**

The Big, the Small, and the Expensive

THESE MODELS range from the light (but pricey) Sony DCR-IP1 and the feature-rich Panasonic PV-DV953 to the budget-price Canon ZR80.

DIGITAL CAMCORDER	Street price (3/26/04)	Normal/low-light image quality	Battery life ¹ (hr:min)	Optical zoom	LCD size (inches diagonal)	Viewfinder	Video-assist light	Recording media (video/still)	Still-image maximum resolution (pixels)
Canon ZR80 ★★★★☆ find.pcworld.com/41774	\$350	Fair/ Fair	1:30	18X	2.5	Color	None	MiniDV/None	n/a
Canon ZR90 ★★★★☆ find.pcworld.com/41776	\$520	Fair/ Fair	1:24	22X	2.5	Color	White LED	MiniDV/SD	1024 by 768
JVC GR-D72US ★★★★☆ find.pcworld.com/41778	\$450	Very good/ Very good	1:20	16X	2.5	Color	White LED	MiniDV/SD	1024 by 768 ²
Panasonic PV-DV73 ★★★★☆ find.pcworld.com/41780	\$580	Good/Good	1:02	10X	3.5	Color	Infrared LED, white lamp	MiniDV/SD	1280 by 960 ²
Best BUY Panasonic PV-DV953 ★★★★★ find.pcworld.com/41782	\$980	Outstanding/ Outstanding	2:11	10X	3.5	Color	None	MiniDV/SD	2048 by 1496
Sharp VL-Z800U ★★★★☆ find.pcworld.com/41784	\$650	Very good/ Good	2:07	10X	2.5	Color	White LED	MiniDV/SD	1280 by 960
Sony DCR-DVD300 DVD Handycam ★★★★☆ find.pcworld.com/41854	\$900	Very good/ Good	1:00	10X	3.5	Color	Infrared LED	DVD/DVD	1152 by 864
Best BUY Sony DCR-HC20 MiniDV Handycam ★★★★★ find.pcworld.com/41856	\$450	Good/ Fair	2:08	10X	2.5	Black and white	Infrared LED	MiniDV/None	n/a
Sony DCR-IP1 MicroMV Handycam ★★★★☆ find.pcworld.com/41924	\$950	Very good/ Very good	1:28	10X	2.0	None	None	MicroMV/Memory Stick Duo	1280 by 960

n/a = Not applicable. **FOOTNOTES:** ¹ Time for the camcorder's battery to go from fully charged to exhausted while recording to tape or disc with the LCD active. ² Interpolated resolution.

HOW WE TEST: We tested the camcorders in a variety of lighting situations; the normal-lighting score combines results for both indoor and outdoor lighting tests. In the low-light test, we used the mode suggested in the manufacturer's manual. The camcorder's built-in lights were not used.

with low-light shooting modes, their implementations range from basic to deluxe. Canon's ZR80 offers one low-light mode that slows the shutter speed down to capture more light. Panasonic's PV-DV73 offers three low-light modes: a slow-shutter-speed mode, another that uses a white LED, and a third that uses an infrared light—good for discreetly recording deer in your backyard after dark.

Canon ZR80

★★★★☆ \$350

VERDICT: This stylish, small, and reasonably priced camcorder is hindered by awkward controls. find.pcworld.com/41774

CANON'S ENTRY-LEVEL CAMCORDER is the cheapest that we reviewed and comes with some very useful features, such as an 18X optical zoom and a flip-up color



CANON ZR80



CANON ZR90

viewfinder. But for a camera aimed at beginners, it's not that easy to operate.

To be fair, the ZR80 remains comfortable in the hand when you are shooting for long stretches. The buttons on the side and back are well placed, so you won't accidentally press them while filming. And at 20.3 ounces, it is one of the lightest camcorders we tested.

But the excessive number of functions on one button was confusing, and the menus were counterintuitive at times. The on-screen menus often had options in unexpected locations—we had to read the manual to find out how to set the time and date, for instance. The camcorder is also missing a few things that you get in more expensive models: It lacks a memory slot for storing still images, a socket for connecting an external microphone, and an S-Video-out port.

What's more, the ZR80 didn't do well in our low-light tests: The video was excessively grainy, and colors looked pale. The unit was also near the bottom of the pack in our normal-lighting tests. Battery life clocked in at a respectable hour and a half; and we found we could do virtually everything using the viewfinder, namely shoot, play back, and use the menus. The only thing we couldn't do with it was listen to the audio during playback—you have to flip out the LCD screen for that.

Canon ZR90

★★★★☆ \$520

VERDICT: It boasts some useful features, but the controls are awkward and take some time to learn. find.pcworld.com/41776

THE ZR90 HAS the same external design as the ZR80, but adds extra features such as a powerful 22X optical zoom lens; an

improved low-light shooting mode and the ability to save both still images (up to a maximum resolution of 1024 by 768 pixels) and video clips to an SD card. It can also save a 640-by-480-resolution still shot to the memory card while simultaneously recording video to tape. The white LED video-assist light mounted on the front of the camera is a boon for low-light shooting—but it's effective only for 2 to 3 feet.



Figure 1.

Canon bundles a wide-angle lens attachment (see **FIGURE 1**) that's useful for getting more of your subject into the frame, but fumble-fingered users beware: The lens attachment is a little awkward to attach and easy to drop. Also, the ZR90 has the same problems as the ZR80: Buttons on the rear of the body are in awkward locations, and one button has too many functions packed into it. The menu system also takes some time to figure out.

JVC GR-D72US

★★★★☆ \$450

VERDICT: This attractive camcorder comes with lots of features for a low price, but quirky controls make it difficult to use. find.pcworld.com/41778

THIS CAMCORDER HAS a lot going for it: the ability to take still images and save them to an SD card, a powerful 16X optical zoom, and a bright-white LED video light. The GR-D72US also scored above average in our image-quality tests, capturing subtle and accurate colors.

However, the camcorder was awkward to hold, and we often inadvertently triggered the hypersensitive Record button on the rear of the camcorder body. This is especially worrying, as you can too ►

	A/V inputs	A/V outputs	Weight (ounces)
	Composite, FireWire	Composite, FireWire	20.3
	Composite, FireWire, S-Video	Composite, FireWire, S-Video	20.3
	Composite, FireWire, S-Video	Composite, FireWire, S-Video	20.8
	Composite, FireWire, S-Video, microphone	Composite, FireWire, S-Video	23.1
	Composite, FireWire, S-Video, microphone	Composite, FireWire, S-Video	31.1
	Composite, FireWire, S-Video	Composite, FireWire, S-Video	19.5
	Composite, FireWire, S-Video, microphone	Composite, FireWire, S-Video	27.8
	FireWire, microphone	Composite, FireWire, S-Video	15.7
	Composite, FireWire, S-Video	Composite, FireWire, S-Video	10.0



JVC GR-D72US



PANASONIC PV-DV73

easily start recording by pressing the wrong button, accidentally overwriting video you may want to keep. The viewfinder is a pleasure to look through, displaying bright, crisp video. However, it can't tilt up, which means that you will have to use the LCD screen except when you are shooting at eye level.

Panasonic PV-DV73

★★★★☆ \$580

VERDICT: The PV-DV73 offers plenty of options for low-light shooting, but its battery life is short and it comes with a few quirks. find.pcworld.com/41780

THE PV-DV73 SPORTS an extremely bright fluorescent light (see **FIGURE 2**) that illuminates objects 5 or 6 feet away: If you were ever to get lost in the woods filming your version of *The Blair Witch Project*,



you could use the appurtenance as a flashlight to find your way home.

One area where the PV-DV73 is superior to its more expensive stablemate is in low-light-shooting features. It's the only DV camcorder we tested that offers both white LED- and infrared-assisted video. The menus and controls are generally easy to use, with informative names and simple navigation. Button and dial placement worked well, too; we liked the combined zoom and volume control, as well as the smooth-action jog wheel. However, the menu-key placement (on the upper-right back panel next to the viewfinder) is difficult to get to with your right thumb: Instead, you have to reach around the viewfinder with your left hand.

The camcorder's case feels uncomfortable—a protruding corner digs into the

palm of your hand after you've held it for a few minutes. The DV73 also turned in the shortest battery life of all of the MiniDV models: a disappointing 1 hour, 2 minutes. You can take still images at a resolution of up to 1280 by 960 pixels, though these are interpolated; the unit's sensor has a resolution of 640 by 480, and the camcorder boosts the resolution by making up the extra pixels. The images it produced looked fine, though.

Panasonic PV-DV953

★★★★☆ \$980

VERDICT: Although it is on the expensive side, the PV-DV953 is a great choice for the serious videographer. find.pcworld.com/41782

Best BUY IF WE THREW an awards night for consumer camcorders, the PV-DV953 would be insufferable. It sweeps all other contenders off the stage in many categories, from sturdiness to superior video to very long battery life and extensive still-image features.

For \$980, your expectations should be high: The PV-DV953 is the priciest MiniDV camcorder included in this roundup. In our video taste tests, the DV953 produced exceptionally sharp images and deep, rich colors. Additionally, the DV953 takes the highest-resolution still images of all the units reviewed here, at up to 2048 by 1496 pixels. (See "Camcorders for Video and Stills" on page 116.)

Though the PV-DV953 is not much bigger than the other models, it is a little heavier. It's comfortable to hold nonetheless. Given all its features, it's not surprising that the PV-DV953 has a surfeit of buttons, dials, and menus; these controls are mostly easy to reach and press. Battery life was a long 2 hours, 11 minutes. ▶

Shooting Video Without Tape?

THERE'S A NEW generation of camcorders in town. Instead of recording on videotape, these camcorders store video on SD flash memory cards. However, our experience with two of these pricey newcomers showed that the age of videotape isn't over yet.

We informally tested two camcorders that store video on SD cards: the \$800 Fisher FVD-C1 Pocket CameraCorder (find.pcworld.com/41844) and the \$700 Panasonic SV-AV100 (find.pcworld.com/39521). Both come with a 512MB SD card that can hold up to an hour of video and are smaller than any of the videotape counterparts we reviewed, measuring just over 1 inch thick, 4 inches high, and 3 inches wide, and weighing around 6 ounces.

In our trials, both the FVD-C1 and

THE FISHER FVD-C1 (left) and Panasonic SV-AV100 (right)



the SV-AV100 produced reasonably good video, but neither model's output was nearly as good as the video produced by even the cheapest tape camcorder. Compression artifacts produced blocky, occasionally jerky video.

SD media cards aren't cheap, either. Expect to pay around \$200 for an extra 512MB SD card; by comparison, a MiniDV tape that holds 90 minutes of video costs around \$10. So while tapeless camcorders are certainly interesting devices, tape-based camcorders still triumph on both video quality and cost.

—Richard Baguley

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PANASONIC PV-DV953



SHARP VL-Z800U



SONY DCR-DVD300

Sharp VL-Z800U

★★★★☆ \$650

VERDICT: The VL-Z800U's innovative design makes it a flexible, easy-to-use camcorder. find.pcworld.com/41784

If you ever played around with a Rubik's Cube, Sharp's boxy camcorder will bring back memories. This small, squat unit



Figure 3.

has two parts that are joined together but can rotate independently (see **FIGURE 3**). You can hold and use the camcorder in a lot of positions—like shooting over people's heads or peering underneath a fence—without straining your wrist or

removing your hand from the strap. It's ideal for places where you need to keep a firm grip on the camcorder, such as in a crowd or on a Ferris wheel.

This cam is less clever when it comes to shooting in low-light conditions: Both of the Z800U's low-light modes produced video that looked a little grainy and colorless compared with some other models. The Z800U produced attractive video in normal light, but it was not as sharp as Panasonic's PV-DV953. The battery life was excellent at 2 hours, 7 minutes.

Sharp significantly reduced the number of external controls, moving many functions to a directional key, which makes for good VCR control and simplifies menu navigation. But the company perhaps

went a little overboard, burying in menus some functions that might have been better put onto their own buttons.

Sony DCR-DVD300 DVD Handycam

★★★★☆ \$900

VERDICT: Although this cam's ability to shoot straight to DVD sounds attractive, the process is awkward. find.pcworld.com/41854

What an appealing concept: You record your video to a DVD right inside the camcorder, drop the disc into your DVD player, and—voilà!—you're instantly reliving those precious moments.

Not so fast, Spielberg! Unfortunately, the reality of the Sony DCR-DVD300 ►

Camcorders for Video and Stills

THE WORLD'S GONE mad for things that multitask—motor oils that lubricate *and* protect, shampoos that clean *and* condition, even refrigerators that let you surf the Web. Many such products are mediocre at one task or the other; for example, camcorders usually take poor still images. However, newer camcorders from Panasonic and Samsung take surprisingly good shots. Panasonic's PV-DV953 uses three CCDs to capture both video and 3-megapixel still images; Samsung's SCD5000 (find.pcworld.com/41922) uses



The Samsung SCD5000 (right) produced inaccurate skin tones, compared with the Nikon Coolpix 3700 (left).

a 0.68-megapixel CCD for video and a separate 4.1-megapixel CCD for stills. Another bright spot: The PV-DV953's 10X zoom lens lets you take phenomenal closeups. Plus, the Panasonic's 3.5-inch LCD dwarfs that of any digicam.

Overall, though, even these models don't perform as well as comparable digital still cameras. The Panasonic's shots were fairly sharp, but colors were a bit off.

The Samsung's shots had better color and were sharper. But neither camcorder's images stacked up to those of the 3.2-megapixel Nikon Coolpix 3700 (a Best Buy last month).



THE SAMSUNG SCD5000 has two lenses: one for video, one for still images (inset).



Both of these camcorders are big and heavy, and they relegate photo functions to secondary buttons and hard-to-locate menus. To take a photo with the PV-DV953, you have to switch to camera mode and press a tiny button on the top of the body. With the SCD5000, you must rotate a portion of the camcorder's body 180 degrees to put it into still-image mode.

In a pinch, photo capabilities are nice to have in a camcorder, but it's still best to keep the pudding away from the peas—and separate your picture taking from your video recording. —Alan Stafford

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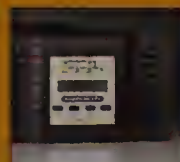
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Handycam doesn't live up to the expectation. Though it's a promising start, the technology needs to improve in key areas. The process of recording to DVD itself is trouble-free, but you'll spend a lot of time waiting for other things to happen. A MiniDV camcorder is ready to record a few seconds after you insert a blank tape, but the DVD-300 makes you wait 30 seconds while it prepares a blank MiniDVD DVD-R disc before you can start to record. And once the cam has finished recording, you then have to wait up to 10 minutes while it finalizes the disc before you can sit down and watch it in a DVD player.

MiniDVD discs (see **FIGURE 4**) seem to be in short supply, too; most of the stores we checked that carry MiniDV tapes didn't stock the discs. And they aren't cheap: At \$33 for a three-pack of MiniDVD DVD-RW discs, they're significantly pricier than MiniDV tapes.

The cam sits relatively comfortably in the hand, although it is a bit chunky and, at 27.8 ounces, is on the heavy side. It's also covered with buttons and dials, although these controls are sensibly placed, and the menu system is easy to navigate. The battery ran out of steam after just an hour in our tests—the shortest time among the models in this group.

Sony DCR-HC20 MiniDV Handycam

★★★★☆ \$450

VERDICT: This is a stylish, small, low-cost camcorder that is comfortable to hold and easy to use. find.pcworld.com/41856

Best BUY WEIGHING UNDER A POUND and measuring 2 by 3.5 by 4.5 inches, the HC20 is the smallest MiniDV camcorder we reviewed here.

With a comfortable strap and a curved base, the HC20 quickly became a natural extension of our hands. We especially liked the switch that makes jumping between record and playback modes quick. As small as the HC20 is, we had no problem using its few external controls.



SONY DCR-HC20



SONY DCR-IP1

The zoom rocker control is tiny, but it works smoothly. For the other controls, Sony took a different approach—it moved them to a touch-screen menu on the unit's flip-out LCD. We were initially dubious about this arrangement, because the screen is only 2.5 inches. But the system works very well, largely due to sensibly designed menu trees and widely spaced icons. We found navigating the menus easy using the left hand.

Although we didn't rate the image quality of the HC20 as the highest on the chart, it was more than adequate for general use. We found the low-light video to be rather flat and grainy, though. Fortunately, the unit had an excellent battery life of 2 hours, 8 minutes.

Sony DCR-IP1 MicroMV Handycam

★★★★☆ \$950

VERDICT: For users who seek small above all, the DCR-IP1 is a compelling choice that works well, but it costs twice as much as some MiniDV peers, and it uses pricey, hard-to-find media. find.pcworld.com/41924

SONY'S DCR-IP1 is the smallest camcorder in this roundup, at just under 2 inches wide, 4 inches high, and 2.5 inches deep. But the camera is so compact

that it can sometimes be difficult to hold and use; we kept accidentally waving fingers in front of the lens.

The IP1 uses the same touch-screen menu system as the one found on Sony's DCR-HC20, except that the screen is slightly smaller, which means we occasionally made wrong selections. On the whole, however, we accessed the menus just fine, and the screen felt durably mounted on its hinge.

The IP1 delivered great-looking video in our tests. This surprised us, considering that the camcorder saves video in a highly compressed MPEG-2 format on diminutive MicroMV tapes (see **FIGURE 5**). MicroMV tapes are expensive, too, costing \$10 to \$12 for each 60-minute tape.

In the end, we can't recommend the IP1 because of its high price and media constraints. You should consider this \$950 model only if you absolutely have to have a really compact camcorder. And you should try it out first to see if it fits comfortably in your hands. ■

Bryan Hastings is a freelance writer and cameraman. Richard Baguley is a senior associate editor and Alan Stafford a senior editor for PC World.



Figure 5.

Get More Info on Digital Video

WANT MORE INFORMATION about shooting digital video, editing your movies, and recording your videos onto DVD? Here are links to some helpful articles on PCWorld.com.

- Convert Your Videotapes to DVD find.pcworld.com/42070
- Fast-Lane DVD Burning find.pcworld.com/42072
- Good-Bye, VHS; Hello, DVD find.pcworld.com/42074
- Put It on DVD find.pcworld.com/42076

HE DOESN'T PLAY FAIR.



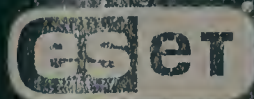
WHY THE HELL SHOULD YOU?

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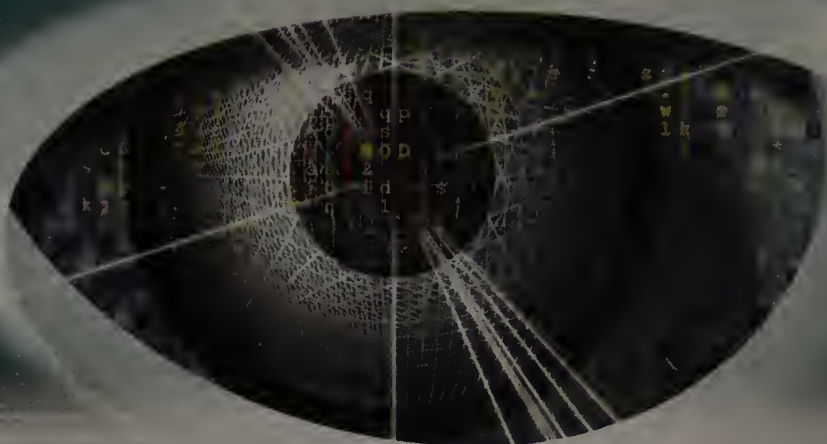
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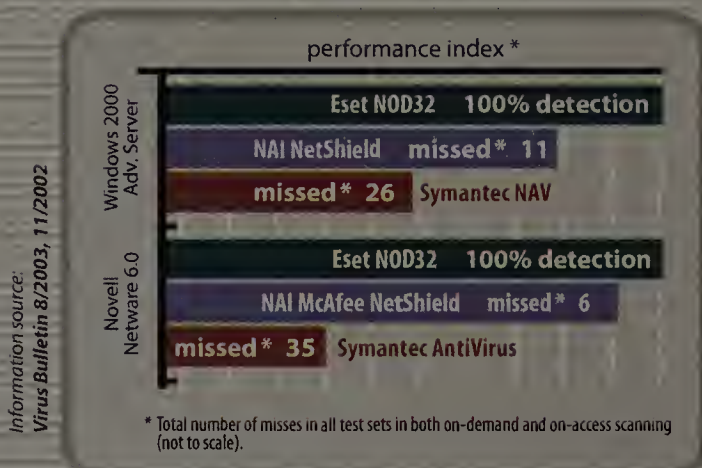


Record winner of Virus Bulletin 100% Awards

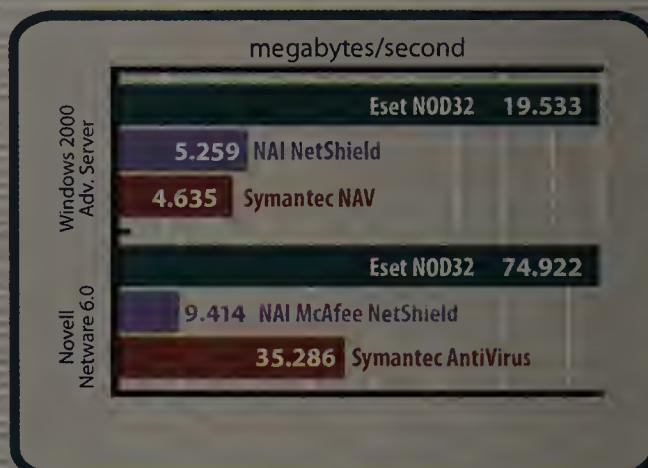
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IS E-VOTING

SAFE?

BY PAUL BOUTIN

Millions will cast their ballots this year using voting machines based on PC technologies. We answer the most pressing questions about ballot box security.

WITH THE PRESIDENTIAL ELECTION less than six months away, election officials are scrambling to purge polling places of the hanging chads, butterfly ballots, and other paper-related problems that plagued the 2000 contest. New touch-screen machines have already been deployed in 27 states.

But as the California primary proved in March, such e-voting systems have flaws of their own. Problems with smart card readers kept 36 ►

precincts in San Diego from opening on time. Orange County poll workers unfamiliar with the system gave voters ballots for the wrong districts, invalidating 7000 votes. As a result, the state's election committee leaders asked California's secretary of state to decertify paperless touch-screen machines so that they can't be used in November's general election.

Ready or not, new touch-screen voting machines will be in thousands of voting booths this fall. The federal Help America Vote Act of 2002 supplied nearly \$4 billion in funding to replace punch-card and lever machines, but mandated that states receiving the funds must replace those machines by this November.

The aging machines' error rates—aggravated by their inability to clearly log the voter's intent (Florida's notorious "hanging chad" problem)—are so high that in 2000 the number of votes separating Bush and Gore was less than the margin of error in the count. But according to MIT professor Ted Selker, cochair of the Caltech-MIT Voting Technology Project, touch-screen replacements aren't faring better than paper-based systems.

Many voters are wondering if they should be worried about the coming election. Unfortunately, the answer is yes, though not for the reasons you might think. Most experts agree that it's highly

unlikely a hacker could walk into a polling place and throw an election. But the electronic nature of the new voting machines, combined with their lack of a physical audit trail for each vote, leaves a hole that crooks with inside access could exploit.

**ROUGHLY 29
PERCENT OF THE
VOTE IN
NOVEMBER WILL
BE COUNTED BY
TOUCH-SCREEN
VOTING
MACHINES.**

—Election Data Services

We've taken a look at the technology behind voting machines to show you how they work and to answer your questions about the specialized computers you may encounter in the booth this fall.

THE TECHNOLOGY

How does e-voting work?

See "E-Voting Step-By-Step" below for a detailed walk-through of voting with Election Systems & Software's IVotronic

system. Most e-voting machines use similar procedures, with variations in the secure media used to activate the machines and the procedures for retrieving votes. All e-voting machines include backup batteries, so they can run for a few hours during a power outage. Votes stay in nonvolatile RAM, so they aren't lost if the batteries die. See "E-Voting Machine Spec Check" on page 125 for information on the guts of different machines.

Do these machines connect to the Net?

No. The booth machines operate independently, or connect only to a local election judge's workstation. They lack the hardware to connect to the Net.

To report results, most systems collect votes onto one voting machine or PC at the polling place. That machine then dials in to a PC at election headquarters and transfers that precinct's tallies over an encrypted modem-to-modem connection. Later, poll workers deliver the memory cards along with a printout of the results.

The PCs used to collect and transmit results aren't supposed to be connected to the Internet while tallying results.

What about my privacy? Is my vote being tied to my name?

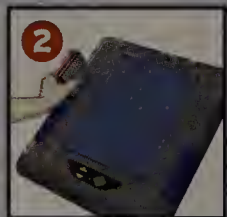
No. Anonymity is an important design factor in e-voting systems to prevent

HOW IT WORKS

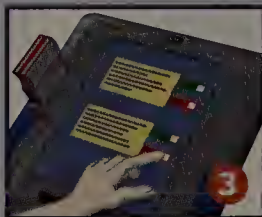
E-VOTING STEP-BY-STEP USING THE ES&S IVOTRONIC



1. A poll worker hands you a Personal Electronic Ballot that contains a chip storing the ballot you need. Machines by other companies put the ballot on a smart card.



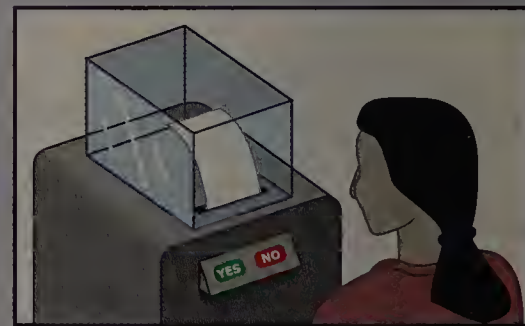
2. You take the PEB to a voting booth and slide it into a slot in an IVotronic machine, activating it for voting.



3. The IVotronic steps you through the electronic ballot, letting you make your choices in each race and review your votes.



4. You press the big red Vote button, storing your votes in triplicate in the IVotronic's internal NVRAM (Non-Volatile Random Access Memory) banks.



Many states will require a voter-verified paper trail in future elections. You'll look at a printout of your vote behind a glass or plastic barrier; then you'll press a button to accept it, or reject it and start over.

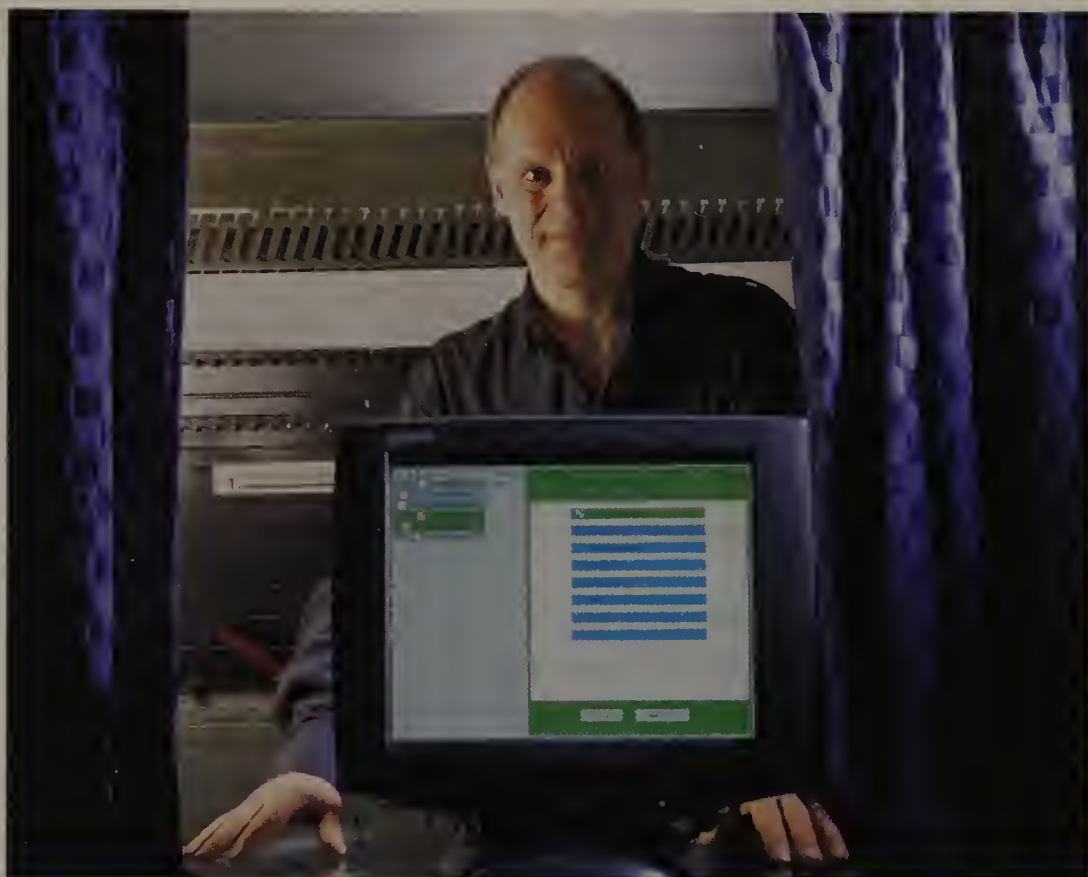
bribery or intimidation. Unfortunately, guaranteeing anonymity also makes it harder to track election fraud and errors.

What's so great about e-voting?

Most important, touch-screen systems can reduce several common mistakes voters make in the booth. They provide immediate feedback on your vote, helping to ensure that you don't vote for too many candidates in a race, forget to vote on an issue, or enter an unintended vote because you misread the interface.

E-voting terminals can be more convenient than paper systems as well. When equipped with headphones and a Braille keypad, touch-screen machines let sight-impaired voters cast their votes without needing to share their choices with a human aide. Officials don't need to supply paper ballots in different languages—voters select the language as a menu option. Results can be transmitted to election headquarters in seconds, and recounts are a snap since each vote is unambiguously stored in memory.

The people who run elections love the machines, says Hugh Gallagher, an independent consultant to state and local election committees nationwide. "If you got a couple of these registrars over a cup of coffee, they'd tell you it is a pain [to deal with paper ballots]," he says. "People put



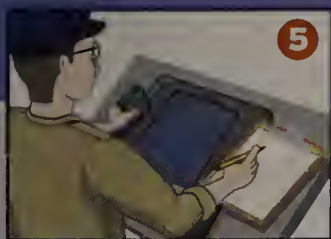
"TOUCH-SCREEN VOTING MACHINES AREN'T DOING AS WELL AS THEY SHOULD BECAUSE PEOPLE AREN'T FAMILIAR WITH THEM YET."

Ted Selker, Caltech-MIT Voting Technology Project cochair

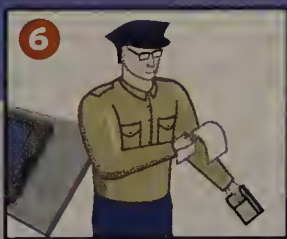
boxes of ballots on top of their car at the end of the day and drive off. You end up out on the freeway with the local sheriff, picking up ballots off the road."

Voters like them too, as e-voting skeptic

Avi Rubin, a Johns Hopkins professor who coauthored a scathing review of the machines' potential security holes last year, discovered when he volunteered as an election judge at a Maryland dis- ►



5. Every hour or so, election judges manually add the totals from each machine to make sure the number of votes matches the number of voters who have come in.



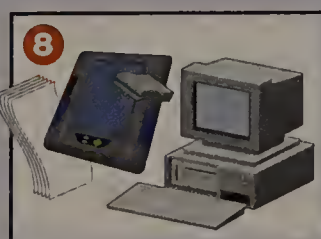
6. At the close of polls, election judges print out final tallies from each machine and load them into a master PEB unit.



7. Election judges post a printout of the local results, transmit them to a special PC at election headquarters over an encrypt-

ed telephone line, and later deliver the master PEB and printouts in person.

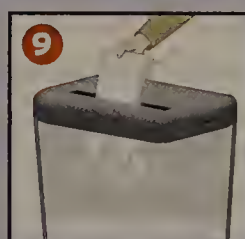
8. In case of a recount or dispute, your vote is stored in several places: in triplicate



on the voting machine, on the printout from the voting machine, on the master

PEB, and on computers at your local precinct and at election headquarters.

9. All records are destroyed according to state or local law after a specified number of days. Destruction is the final security check—it prevents the vote from being tampered with while it's in storage.



trict in March. Rubin reported his experience online (see find.pcworld.com/42062) and was struck by the popular enthusiasm for the same Diebold machines that his report had blasted. "With very few exceptions, the voters really loved the machines," he wrote. "The most common comment was, 'That was so easy.'"

THE PROBLEMS

What about e-voting machines makes people so nervous?

To many experts like Rubin, the machines' biggest vulnerability is simple: There's no way for a voter to know what the machine records when they cast their vote and no voter-verified physical record available for recounts. If the software goes awry or is tricked into flipping votes, no one will be able to tell as long as the total ballot count stays the same.

What types of problems have occurred?

The November 2003 election in Fairfax County, Virginia, was a showcase for e-voting bugs. When polls closed at 7 p.m., many of the county's 223 precincts tried to transmit their results to the election center at once, tying up the line for hours. Many precinct judges gave up and drove their tallies to headquarters. A software problem delayed some results for 21 hours. Voters claimed that some of the booth machines crashed and had deleted some votes before their eyes. Election officials repaired ten broken machines off-site, with vote data inside, then returned them to service—a violation of state law.

Wasn't the software on these machines certified before the election?

Yes. But according to Harvard research fellow Rebecca Mercuri, a computer scientist who has worked elections for two decades, the certification tests look for logic errors and vote-counting mistakes, not security holes. Much of the testing is automated, and layers beneath the voting applications—compilers, OSs, firmware on the machines' chips—are not examined. Technically, she says, "The certification process is a joke." What's more, vot-

SECURITY HOLES

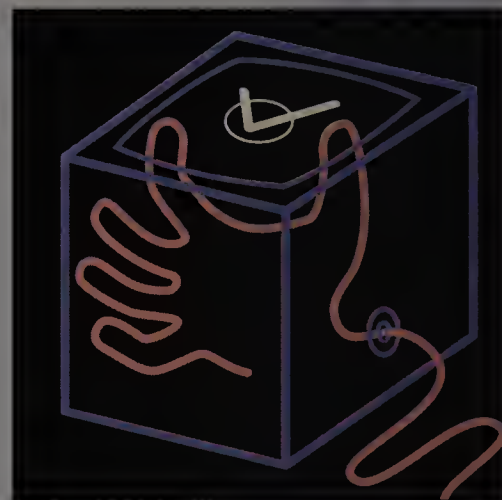
HOW TO HACK AN E-LECTION

EXPERTS WHO HAVE studied electronic voting say there are several ways determined criminals could hack the vote.

Inside Job Employees at a voting machine maker insert vote-rigging code into a software release before shipping it. When the election starts, votes flip from one candidate to a rival. It's the most paranoid of scenarios, but also the most likely to succeed.

Wiretap A hacker intercepts the encrypted calls from each precinct into the election center PC and phones in his own results to headquarters. Winners are announced, and then officials discover the local smart card tallies don't match. Panic!

The Paper Cap E-voting proponents claim that voter-verified printouts will pre-



vent ballot box skulduggery. Oh yeah? Hackers could rig the system to flip a small percentage of votes and allow the machine to print out the switched vote. In their haste to leave, many voters either won't notice or won't bother to revote.

ing machine vendors have distributed uncertified code upgrades to their machines after the certification process was complete, but before an election.

Is e-voting more or less error-prone than other methods of voting?

The Caltech-MIT Voting Technology Project was established in December 2000 to study voting machine reliability and generate guidelines for future voting systems. The project's 2001 report—still considered the definitive study of machine accuracy—found that in elections from 1988 to 2000, touch-screen (also called DRE, for direct record electronic) machines fared worse than paper ballots in many cases (see find.pcworld.com/42088). But generally, their margin of "residual votes"—those thrown out because of error—was within the range of other voting technologies. In presidential elections, for example, punch-card machines had the highest percentage of residual votes, at 2.5 percent. Touch-screen voting machines were slightly better, at 2.3 percent, and optically scanned paper ballots worked best, at 1.5 percent.

Why such mediocre results from a supposedly better technology?

Voting Project cochair Ted Selker says, "[DREs are] not doing as well as they should because people aren't familiar with them yet. The people who create the ballots don't have enough experience."

The wizard-based PC software election officials use to design ballots can't guarantee good design. For example, in one midwestern precinct, a button allowed voters to vote a straight Democratic or Republican Party ticket. But many voters touched the already-checked buttons for their candidates on subsequent screens, which removed their votes instead of confirming them. Other ballots placed a "next screen" button near a button to cast the ballot and exit, which could have caused voters to prematurely end their voting.

Where does e-voting break down?

Closed source code: According to Rubin, "The biggest potential [for election fraud] is when the original code is being written." Mercuri, Rubin, and Selker agree: Since the public can't inspect the code these machines run, a programmer who's

been bribed or threatened, or a manufacturer willing to rig an election, would have the best chance to hack the vote. And while open-sourcing the code of e-voting machines (as the Australian Capital Territory did in its 2001 e-voting pilot program) would help fix security holes and put people's minds at ease, it's not a panacea (see find.pcworld.com/42058).

Poorly implemented security: Independent consulting firm RABA Technologies audited the Diebold machines used in Rubin's Maryland precinct during a simulated vote. They found ample holes for hackers who could get time alone with the machines. One tester was able to pick the physical locks securing the PCMCIA flash memory card that stores the votes in about 10 seconds and gained access to a keyboard port. By attaching a standard keyboard to the voting machine, RABA's team was able to invoke supervisory functions that let them overwrite election results without leaving a trace.

But pulling off any of those hacks without some type of inside access to the voting machines would be extremely difficult. Rubin, whose 2003 report made the machines sound like Swiss cheese, told

PC World that his experience at the polls changed his mind: "I'm becoming more and more convinced that the risks of a voter walking in off the street and throwing the whole election are pretty small."

PCs in the mix: Most touch-screen systems run proprietary operating systems in the booths, though Diebold's machines run on Windows CE. But nearly all systems collect votes on PCs at election headquarters. The PC in the system RABA evaluated hadn't gotten the latest Microsoft security upgrades, which left it vulnerable to the Blaster worm and other viruses should it be connected to the Net.

THE PAPER FIX

Will paper receipts fix these problems?

Yes and no. The biggest danger of touch-screen machines is that if votes are lost or changed, no voter-verified audit trail is available for a recount, and the evidence of tampering could also be erased. To close that hole, California and several other states have mandated that touch-screen machines produce a printed receipt at the end of each voter's session. That printout will be secured behind a transparent screen, so the voter can't take

it or alter it. If the voter accepts the vote as printed, it gets dumped into a secure container for storage. Or the voter can reject the printout and start over.

The Caltech-MIT project has stated there may be a way to design a reliable paperless audit system that's more reliable than a printout, but none exists yet.

Will voting machines have a printed receipt by this November?

Most won't. New equipment must be certified by the Federal Election Commission or by state officials before it can be sold. Most counties and states won't have paper-trail touch screens until 2005 or 2006, though Nevada expects to have them for a third of its voters this fall.

Why don't we forget touch screens and use optically scanned paper ballots?

True, ballots optically scanned at precinct headquarters have the lowest margin of error, and they already create a paper trail. But those ballots can still be misread, and they don't meet the accessibility requirements of the Americans with Disabilities Act without add-on equipment.

What's going to happen in November?

Expect problems with the new machines—mostly because they're new and people aren't used to them yet. Mike Alvarez, Caltech's cochair of the Voting Technology Project, says that "any jurisdictions that have made substantial changes to their voting systems are the places where the most problems are likely to occur." But that applies to adding paper-trail technology, too.

It's a safe bet that, whoever wins, supporters for a losing candidate will claim the paperless machines miscounted votes en masse. Expect to see challenges and lawsuits. Even if the machines work flawlessly, it'll be hard to prove that to a skeptical public that views a paper printout as the only credible form of audit trail. ■

San Francisco-based freelance writer Paul Boutin has contributed to Slate, Wired, the New York Times, and MSNBC.

ON THE INSIDE

E-VOTING MACHINE SPEC CHECK

MOST (85 PERCENT) OF THE e-voting machines that will be used this November are built by one of three companies: Diebold Election Systems, Election Systems & Software, and Sequoia Voting Systems. Here's what the machines are made of.

		
Diebold Accuvote-TS	ES&S IVotronic	Sequoia Voting Systems
• 400-MHz Intel PXA-255 CPU • Windows CE • 64MB of flash memory • Removable 32MB-128MB PCMCIA smart card for vote storage • 9-by-12-inch touch screen	• 25-MHz Intel 386EX CPU • Proprietary OS • Three 2MB NVRAM audit log and image storage caches • Removable NVRAM or 16MB-196MB CompactFlash for vote storage • 13.5-by-10.4-inch touch screen	• National Semiconductor Geode CPU (300-MHz Pentium equivalent) • Proprietary OS • 32MB (or greater) CompactFlash • Removable 128MB (or greater) PCMCIA card for vote storage • 9-by-12-inch touch screen



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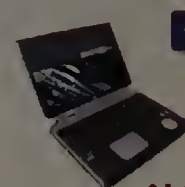
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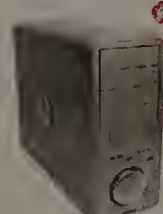
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PC WORLD Senior Associate Editor Tom Mainelli builds a PC.

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NEXT GEAR

EDITED BY ALAN STAFFORD

MAKE A MEDIA-SAVVY PC

HERE'S HOW TO CUSTOM-DESIGN A MACHINE TO HANDLE TV AND MUSIC WITH APLOMB—OR JUST MAKE YOUR CURRENT SYSTEM MORE ENTERTAINING. **BY TOM MAINELLI**

INTRIGUED BY THE idea of using a computer to enjoy movies, music, and television, but unimpressed with the Media Center PCs from big-box vendors like Dell and Hewlett-Packard? Build your own.

True, Microsoft won't sell you its Windows XP Media Center Edition operating sys-

tem, which combines all of the features you want—TV (live and recorded), movies, music, and photos—with a single, slick interface (it ships only with complete systems). But you can tailor a media-savvy PC to your own specific requirements by using hand-picked components.

You might even save some money, but don't count on it. Just as few do-it-yourselfers can build a standard desktop PC for less money than a computer maker's entry-level offering would cost, you'll find it hard to beat the big players' bottom lines on a media machine. Building your own sys-

tem is more about the enjoyment you'll get creating a custom rig—picking your own parts, from CPU to graphics card to hard drive, assembling them, and seeing them work—than about saving a buck.

The key to success is deciding up front how and where you'll use your new PC ►

and how much money you'll spend on it. Will this primarily be a serious desktop PC—for number crunching, video editing, and 3D gaming—that occasionally doubles as a TV and stereo? Or will it be a living-room device that handles only light desktop computing duties? Do you require the higher-quality audio a stand-alone sound card can provide, or is integrated audio enough

for you? Is a remote control a must-have or just more gear destined to gather dust?

Before you start, take stock of the peripherals you already have. Examine your monitor or television (the bigger the better), your speakers (either the PC variety or a set connected to a typical audio receiver), and your home network (for Internet connectivity and for sharing files with your

other PCs). Is each up to the task of supporting your slick new entertainment PC?

I built two systems for this story: an unobtrusive, ultra-small, living room-friendly computer with midrange to low-end components that balance performance and price (total cost: \$1120 street); and a high-performance PC packed with first-rate parts and a case well suited to a home office or

family room (total cost: \$2650 street). See the chart below for individual component prices. If you would rather upgrade your current PC than start from scratch, see the sidebar on page 130. And finally, visit find.pcworld.com/42086 for more-detailed instructions.

THE BIG SHOOTER

FOR THE HIGH-powered PC, I started with Antec's classy-looking (albeit fingerprint-prone) piano-black Overture case, which includes a quiet 380-watt power supply. Inside it I installed an Intel Desktop Board D875PBZ, which tested well for our March *Top 100* Spotlight on motherboards. To ensure optimum performance on computing tasks as well as on multimedia functions, I selected Intel's 3.4-GHz Pentium 4 with 512KB L2 cache (and its unexpectedly noisy standard-issue fan). To complement the CPU's muscle, I installed 1GB of high-end 500-MHz DDR memory. The pricey, performance-gear setup worked well: My Antec-based PC turned in an impressive mark of 132 on PC WorldBench 4.

To process a TV signal, your PC needs a TV-tuner card. For the fancy system, I also wanted a top-notch graphics board capable of handling typical work-related PC chores (you know, like playing the upcoming *Half-Life 2*), so I chose ATI's top-of-the-line All-In-Wonder 9800 Pro card. ATI's premium cards have scored well on our *Top 10 Graphics Boards* chart, and the All-In-Wonder 9800 Pro bundle includes an impressive array of multimedia features, plus a remote control that works via radio frequency instead of in-

COMPONENTS

ENTERTAINMENT PC PARTS LIST

WE BUILT TWO entertainment-oriented PCs—one (at left) to minimize the cost and the other to suit a more generous budget—using off-the-shelf components. Both will function as digital video recorders, show DVD movies, and play MP3 files; they differ most in how they perform as computers. Of course, you can outfit your entertainment PC any way you want—that's the point of building your own.



COMPONENT	VALUE PC		HIGH-END PC	
	Model chosen	Price	Model chosen	Price
Case	Shuttle XPC SN41G2	\$275	Antec Overture	\$129
CPU	1.83-GHz AMD Athlon XP 2500+	\$90	3.4-GHz Intel Pentium 4 with 512KB L2 cache	\$450
RAM	256MB Kingston PC2700 (333-MHz) DDR	\$72	1GB Kingston PC4000 (500-MHz) DDR HyperXDDR	\$433
Motherboard	Shuttle FN41 (included with case)	n/a	Intel Desktop Board DB75PBZ	\$150
Graphics	ATI All-In-Wonder 9200	\$149	ATI All-In-Wonder 9800 Pro	\$399
Sound	Integrated audio	n/a	Creative Sound Blaster Audigy 2 ZS Platinum card	\$200
Hard drive	160GB Seagate Barracuda ST3160023A	\$140	200GB Seagate Barracuda ST3200B22AS	\$200
Optical drive	TDK IndiDVD 440N 4X DVD±RW drive	\$145	TDK Internal Indi DVD 8x+/Bx- Multifunction Burner BBON DVD±RW drive	\$200
Keyboard/mouse	Logitech Cordless Desktop Express	\$50	Gyratation Ultra GT Compact Keyboard Suite	\$120
Software	Windows XP Home	\$199	Windows XP Home; Beyond TV 3; StreamZap Remote; Adobe Photoshop Album 2	\$369
Street price (4/6/04)	Complete unit	\$1120	Complete unit	\$2650

n/a = Not applicable. Visit find.pcworld.com/41944 for links to details about each component listed above.



CREATIVE'S SOUND BLASTER AUDIGY 2 ZS Platinum sound card comes bundled with a control-laden drive bay module.

frared (so you needn't point the remote directly at the PC).

To achieve the best-possible audio, I selected the Creative Sound Blaster Audigy 2 ZS Platinum sound card. In addition to 7.1-speaker surround sound, the Audigy provides an unusually high level of audio quality, and it comes with a drive-bay module that puts all of your controls on the front of the PC. It was our top pick in the February issue's *Top 100 Spotlight* on sound cards.

Another necessity for any media-savvy PC is a hard drive big enough to hold plenty of MP3s and hours of television (high-quality MPEG-2 video recording requires as much as 3GB of disk space per hour). For ample storage and high-speed performance, I selected the 200GB, Serial ATA Seagate Barracuda ST3200822AS with 8MB of cache; it's the big sibling of the highly ranked 160GB drive in our January *Top 10 Hard Drives* chart.

I picked TDK's Internal Indi DVD 8x+/8x- Multiformat Burner 880N drive for DVD viewing as well as for speedy DVD and CD burning. The drive's solid performance and good software package landed it on this month's *Top 10 DVD Drives* chart (see page 153).

Finally, no PC—whether headed for the living room or not—is complete without a keyboard and mouse, but that doesn't mean you have to be tethered to the computer. My

pick here was Gyratation's Ultra GT Compact Keyboard Suite. The petite size of the keyboard makes it perfect for lap use (although it's too cramped for long bouts of typing), and the accompanying wireless rechargeable mouse performs smartly on a flat surface or even in midair thanks to a nifty internal gyroscope.

THE LITTLE GUY

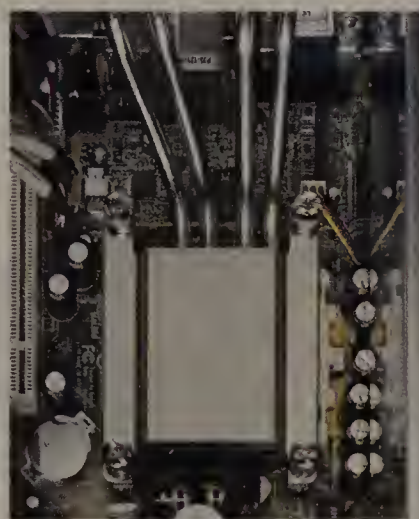
FOR THE RELATIVELY modestly priced living-room PC, I chose Shuttle's XPC SN41G2 bare-bones PC kit, in part for its diminutive size and in part for the integrated surround sound on the included motherboard. This was my first attempt at putting together a small-form-factor PC, and I was instantly impressed with the Shuttle's fine engineering, its high-quality construction, and the well-conceived heat-pipe cooling for the CPU (which eliminated the need for a processor fan). Looking to keep costs low, I selected an affordable AMD Athlon XP 2500+ CPU and only 256MB of DDR333 memory. Notwithstanding its modest processor and memory allotment, the Shuttle posted a respectable score of 122 on our PC World-Bench 4 test suite.

For this machine, I picked the ATI All-In-Wonder 9200 graphics board. It's substantially cheaper than the All-In-Wonder 9800 Pro, and while it

doesn't offer the same graphics processing power, it includes most of the same multimedia features (however, it lacks the Remote Wonder, a \$25 upgrade). I opted for the ATI card over a slightly pricier but equally robust NVidia Personal Cinema GeForce FX 5200 card from EVGA (which ships with a remote). Either should serve you well.

For storage, I went with the slightly more cost-effective 160GB Seagate Barracuda ST3160023A Ultra ATA hard drive. I cut the optical drive back a notch as well, to the older, less-expensive 4X standard, picking TDK's IndiDVD 440N 4X DVD±RW drive.

Logitech's extremely solid Cordless Desktop Express keyboard rounded out my setup, offering me reliable RF con-



SHUTTLE'S PC KIT uses heat pipes to cool the CPU, thereby eliminating the need for a processor fan.

nectivity and optical mouse capabilities in a slightly bland but very affordable package.

FINISHING TOUCHES

THE PRIMARY APPEAL of an off-the-shelf Media Center PC is its operating system, which provides an intuitive interface and remote-control compatibility for easy access to the multimedia options—even when

you're not sitting directly in front of the PC. Without that operating system, you can't obtain the same one-program-does-all coherence, although some bundles do come pretty close (notable among them: CyberLink's \$60 PowerCinema, InterVideo's \$100 Home Theater, and SnapStream's upcoming Beyond Media).

Fortunately, ATI's Multimedia Center and NVidia's Personal Cinema, both of which ship with their respective TV-tuner cards, offer many of the same functions, including TV viewing and recording and movie and music playback (ATI recently introduced radio functionality to some of its packages, too). To keep costs down on the affordable PC, I used only the software that came with its video card (plus free downloadable apps); on the pricey system, I indulged in a few well-chosen extras.

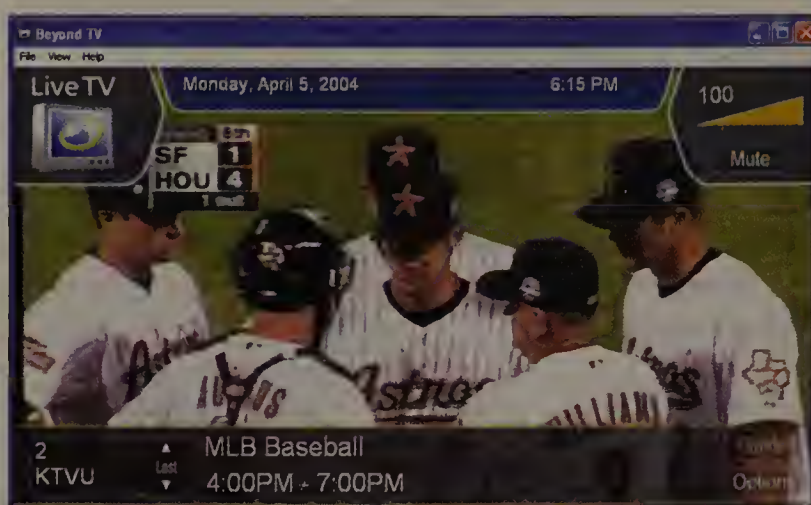
SnapStream's Beyond TV 3 program was one such extra: For \$80 you get a nicely integrated TV viewer and recording scheduler far better than the kludgy Guide+ software that ATI ships with its cards. Beyond TV 3 almost matches TiVo's easy-to-use interface, but it lacks that service's ability to predict shows you'd like recorded (it also lacks TiVo's service fee).

For music playback on both PCs, I selected Music-match's JukeBox 8, a free download that lets you easily organize and listen to MP3s; it offers access to free online radio and for-pay digital music downloads, too. For playing movies, I stuck with ATI's included software DVD player, which presents a clean interface and such functionality as a ThruView feature that ►

shows movies without blocking access to the PC desktop. To handle photo viewing and slide-show organizing on the high-end system, I chose Adobe's \$50 Photoshop Album 2.

And to top off my monster system, I added Streamzap's remote control. This \$40 device includes basic software so you can use the remote to operate any one of your favorite apps (more than 100 in all).

After I spent weeks joyfully testing both systems (using a parade of different LCDs and Klipsch's \$400 ProMedia Ultra 5.1 speakers), a clear favorite emerged—and it wasn't



BEYOND TV 3's excellent interface makes it my DVR app of choice.

the one I expected. The Antec case was clearly a crowd pleaser (and the system packed the more powerful hardware configuration), but its stock P4

fan made it noisier than I had expected. Before I'd put that PC in my living room, I would need to spend more money to upgrade to a quiet CPU fan.

Meanwhile, the Shuttle was a quiet success out of the box. BIOS settings let me lower the unit's fan speeds without affecting the PC's performance. Factor in its attractive size and reasonable price tag, and the Shuttle makes a compelling argument for building your own. Throw in a few extras, like ATI's Remote Wonder and SnapStream's Beyond TV 3 software, and you'll find that this sleek little package is hard to beat, no matter where you decide to set it up. ■

Tom Mainelli is a Senior Associate Editor for PC World.

UPGRADE

TURN A PC INTO THE KING OF ALL MEDIA

YOU DON'T NEED to start from scratch to fashion yourself a workable media-savvy PC. If you've recently retired a PC, a few strategic upgrades can have the old beige bomber making like a TiVo in no time. Just beware of creeping costs: If your upgrade estimate passes the \$300 or \$400 mark, consider starting over (and turning that old faithful into a footstool).

Digital video recording is likely the most intensive processing your updated PC will do, so plan your upgrade around handling this function. I recommend SnapStream's \$80 Beyond TV 3 software for DVR duties, as it offers the slickest interface of the three packages I've tested, along with such useful features as the ability to skip easily through commercials. The app does have some strict system requirements, however. Among them: Windows XP or Windows 2000, 128MB of system memory, and a graphics card with a TV tuner.

Choosing the right graphics card is the most important—and most complicated—aspect of upgrading your PC to act like a DVR. Two criteria will affect your graphics card selection: the speed of your CPU, and whether your current card supports Di-

rectX 9, the Microsoft graphics programming interface that Beyond TV 3 requires.

If your current graphics card doesn't support DX9 but your PC's processor runs faster than 1 GHz, choose a board with a TV tuner based on ATI's Radeon 9200 or



HAUPPAUGE'S WINTV-PVR 250 tuner card provides hardware-based MPEG encoding.

NVIDIA's GeForce FX 5200; both support DX 9 (total price \$150 to \$200). If your current card supports DX9, but your PC has a CPU under 1 GHz, consider a PCI-based TV-tuner card like Hauppauge's WinTV-PVR-250 card (\$150), which includes a hardware encoder to offload some processing. Finally, if your current card doesn't support DX9 and your processor runs slower than 1 GHz, you'll need both a new graphics card with

DX9 support (\$100) and a PCI-based TV-tuner card with hardware encoding.

Beyond TV 3's lowest MPEG-2 video quality setting uses 984MB of storage per hour of programming; its highest setting takes up 3.1GB per hour. Realistically, if your hard drive is smaller than 40GB, you'll find it necessary either to add a second drive or to swap out your existing drive for a larger one. These days, \$140 nets a 160GB drive.

Of course, a media-savvy PC should be able to play DVD movies, and doing this requires, at minimum, a DVD drive (\$30). If you're interested in creating your own movies, you'll need a drive with DVD burning capabilities, as well (a 4X DVD±RW drive goes for \$145). You should be aware, however, that rewritable DVD drives come with their own stiff system requirements.

Finally, older sound cards or integrated audio probably won't give you the high-quality sound you crave. PCI-based cards with multichannel capabilities can be inexpensive (\$50) or pricey (\$200); but with a good set of speakers, the right card can add immeasurably to your entertainment experience (see find.pcworld.com/42092).

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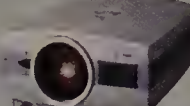
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HDTV RECORDER

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The LST-3410A provides an integrated high-definition TV tuner and a 120GB hard drive to which you can record over-the-air HD broadcasts—great

LST-3410A HDTV Digital Video Recorder/Receiver

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Recording limitations make this DVR/receiver not worth the money.

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LG LST-3410A: First of its kind, but limited by copyright protection.

only if you get good reception and lots of broadcast HD programming—and unscrambled cable HD broadcasts.

Unfortunately, because the 3410A lacks component inputs (for copyright reasons, according to LG), I couldn't connect my HD-enabled cable box. Instead I had to plug the cable line into the 3410A directly; this gave me standard-definition cable but no scram-

bled HD channels like HBO. I also tried connecting the cable box to the LG device via its (analog) AV inputs—but doing that prevented me from receiving HD broadcasts. I could watch and record *The Sopranos* only in standard definition—but I could do that with a \$99 VCR.

LG uses a *TV Guide*-esque interface to show programming and to help you set re-

cordings easily, but it can't perform any of the smart recording juju that TiVo does. Other un-TiVo-like behavior: You can pause and rewind live TV, but you can't pause or rewind during recording.

The list of your recorded programs displays thumbnail images to help you identify episodes easily, and it reports the amount of HD and SD recording time left—helpful because the 120GB drive holds just 12.5 hours of HDTV.

Copyright issues or no, the inability to record the premium HD programs I've paid to receive is a huge limitation. I'm not going to spend a thousand bucks just to record PBS gazelle specials in HD.

—Cathy Lu ■

CELLULAR GPS SERVICE

GPS PHONE LEADS THE WAY

IN MY QUEST for the perfect carpet runner, I tried Motorola's **ViaMoto** GPS navigation service to find a Home Depot Expo Design Center.

On the road and armed with a GPS-enabled Motorola i88s handset with Nextel cellular service, I called a ViaMoto Advisor and asked for help finding the closest Expo. Un-

fortunately, the branch that the rep found wasn't the nearest; ViaMoto could use a better database. Nevertheless, I asked her to download the directions to my phone.

Launching the ViaMoto application on the phone, I selected the destination that the Advisor had identified to call up text directions. While I was driving, I listened to turn-by-turn voice cues from a friendly, computerized chap.

From the freeway, ViaMoto's directions instructed me to turn right onto a street that wasn't a freeway exit. (On a different trip, it incorrectly advised me to turn the wrong way onto a one-way street.)

Not to worry. I got off at the next exit, and the computerized fellow told me I was off my route and asked if I wanted to be rerouted. Well, of course. I chose *Reroute*; the service located my position and downloaded to my phone new (correct) directions.

You can retrieve directions by entering an address (the number, street name, city, and state—zip code isn't recognized) on the phone; doing so can be tedious on a number pad. You can also enter the address at ViaMoto.com. The live rep costs extra.

On top of Nextel's cellular fees, you pay \$11 monthly for a twelve-month contract. Each



HANG A RIGHT: Motorola's ViaMoto navigation service works on Nextel's i730 phone.

time you use ViaMoto, you expend bandwidth from your data plan; and when you call an advisor, you use up voice minutes as well. Despite the cost and fuss, having a GPS navigation service is one reason I'd sign up for a data plan.

—Grace Aquino ■

ViaMoto

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GADGET FREAK

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SWEET HOME THEATER TIPS



THERE ARE TWO varieties of home theater geeks: those who spare no expense building a mini movie palace in their basements, and those who want to stay married. For the latter crowd, the entertainment center is the living room, and any gear they hope to buy must first pass the SAT (spouse approval test).

Acing this SAT isn't for amateurs. So for tips on how to blend home theater gear into your lifestyle—and your relationship—I turned to professional consultants who install entertainment systems.

Screen dreams: Bulky CRTs and rear-projector sets are like Buicks parked in your living room. LCDs and plasmas cost more but earn a much higher SAT score because they look cool, work well in brighter rooms, and fit virtually anywhere. (For more on big TVs,

see find.pcworld.com/41786.)

The size screen you should get depends on where you plan to sit, says David Slavitt, owner of Audio Video Solutions in Montville, New Jersey. With a 42-inch HDTV, you should sit about 7 feet away (twice the width of the screen). With a standard 4:3-aspect set, you can sit even farther away.

Speaker features: You don't need speakers the size of a refrigerator to get great sound, says Kevin McCann of Glenn Poor, an audio boutique in Chicago. He says a bookshelf model such as Linn Products' Katan (\$995 for a pair; find.pcworld.com/41788) will be fine for most living rooms. The best test of a speaker is how well it reproduces subtle sounds, says Dan Liberman of Infinite Sight and Sound in Fairfax, Virginia. "Any speakers can do an explosion," he

says, "but not many accurately reproduce the sound of a babbling brook." A good test is the opening scene of the movie *A River Runs Through It*.

Sound rebound: Speakers hidden inside walls or tucked into cabinets may get a higher SAT score, but they won't sound as good as freestanding ones. You'll want an amp that puts out at least 100 watts per channel, so buy speakers that can handle it. Place the subwoofer at the center of the wall, not in a corner, so that the bass does not overwhelm the music.

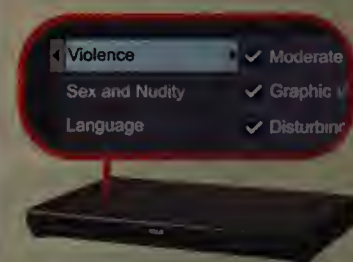
Make sure all speakers come from the same product line; otherwise, sounds may change as they move between brands. You don't necessarily need rear speakers: The left, right, and center channels deliver a film's music and dialogue; rear ones provide the "bullets whizzing by your head" experience but aren't essential.

And because sound waves bouncing off walls can interfere with those coming from the speakers, hang a sound-absorbing object off the first reflecting point—usually the side wall midway between the speaker and you (and no, that *Dogs Playing Poker* tapestry isn't going to cut it).

Able cables: Using higher-quality cables such as models from Cardas and Wireworld (\$60 and up) to connect your DVD player or set-top box to

NEXT UP

Parental-Control DVD Player



NOW KIDS CAN ENJOY the wholesome action scenes of *The Matrix Reloaded* with none of the potty-mouth language. RCA's new DRC232 is the first DVD player to use ClearPlay technology, which lets you mute profanity and automatically skip over scenes containing sex or violence. The \$79 player will ship with filters for 100 movies; subscribe for \$5 a month to get new ones. You can select which filters to use—if, say, you think a little hanky-panky is okay but rapid-fire punching might cause some acting out.

your display will reduce signal loss and improve image quality. Although wireless speakers are not ready for prime time, flat speaker wire that disappears under a carpet will enhance your SAT score—and help convince your spouse that you really do need to install surround-sound speakers behind the La-Z-Boy.

Naturally, all of the experts I talked to suggest hiring an expert to help position the speakers, measure ambient light, and so on. They also recommend dropping at least \$10,000 on the system. Expensive? You bet. But isn't your relationship worth it? ■

Contributing Editor Dan Tynan is a home theater geek in training.

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Road Rules

Getting the most from the mobile manager's technology

>> **Lynnette Tolson** knows exactly what she wants from the technology products that have become such an integral part of the work life she spends largely on the road. As a manufacturer's representative, she traverses the Midwest an average of three days per week, spending most of the rest of her working time in her suburban Cleveland home office.

"I'm the classic road warrior," Tolson says. "The technology I take with me is as important as anything else in my briefcase or suitcase. It's got to be incredibly reliable, because there's no one to fix it. It's got to be versatile enough to work in any environment I happen to find myself in. And it had better be good, because it reflects directly upon me when I'm in front of a client."

When Tolson heads out, it is with several key pieces of technology, including a laptop with wireless capability, a PDA, a portable projector, and a cell phone. She looks for products that not only serve her on the road, but which also integrate well with both her home office environment and her company's central office resources.



The InFocus LP540 makes the most of your presentations.

MEMORABLE PRESENTATIONS

Reliability and performance are hallmarks of the portable projectors available from InFocus. The subject of years of research and IT user input, the InFocus LP540

offers stunning performance and functionality, with portability well-suited to the needs of today's mobile professionals.

The LP540's automatic vertical keystone correction and ceiling detect help make the very most of the images being presented, while 1700 lumens produce remark-

ably sharp clarity. Automatic synchronization with computer and video sources allow for speedy beginnings and seamless transitions. Thanks to a user-defined keypad, users control most commands with a single touch. Adding further to the LP540's ease of use is a 12-language LCD interactive display offering instructions in real time.

Buyers get a bonus when they own technology that is versatile enough for both business and casual use. That is exactly what they get with the InFocus X2,



The InFocus X2 projector: a 2000:1 contrast ratio, a powerful zoom lens, and 1500 lumens of clarity.

a projector that gets the job done during the day and packs enough entertainment features to continue working after hours.

For starters, the X2 features the highly touted Digital Light Processing (DLP) technology from

Texas Instruments. DLP provides the X2 with a stunning 2000:1 contrast ratio. With a powerful zoom lens and 1500 lumens, the X2 is capable

of filling just about any screen or wall with sharp, crisp images.

Other features of the X2 include universal connectivity to laptops, PDAs, DVD players, cable or satellite TV systems, digital cameras, or game consoles. The one-touch operation of a simple keypad virtually guarantees ease of use. And if you've gone wireless, the X2 will fit right into your lifestyle, with its InFocus LiteShow wireless capability.

■ **For more information on the X2 and LP540 projectors or on any of the other superb InFocus offerings, click now on www.infocus.com.**

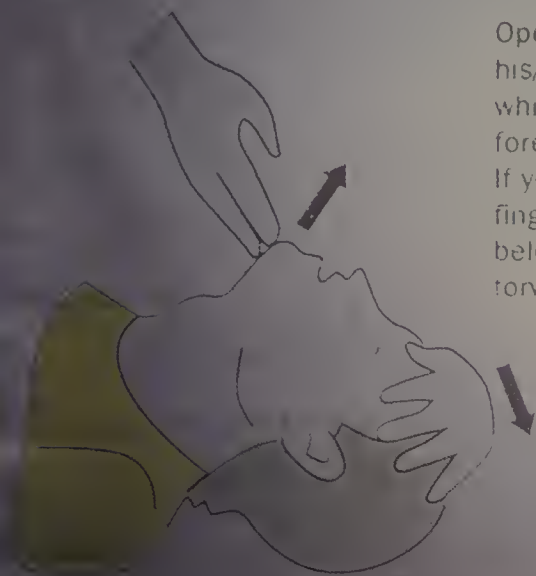
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③ OPEN THE VICTIM'S AIRWAY



Open the victim's airway by tilting his/her chin gently with one hand, while pushing back on his/her forehead with the other hand. If you suspect a neck injury, put your fingers behind the jawbone just below the ear, and push the jaw forward to open the victim's mouth.



Lifesaver.

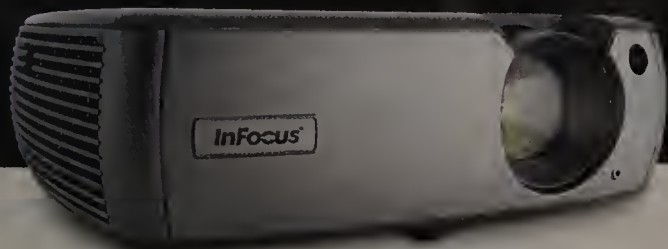
Firefighter. Educator. Presenter.

He takes no chances with his equipment. Neither do you. You require reliability, ease of use and innovative features. So when it comes to projectors, you demand InFocus.

InFocus innovation makes your job easy. You buy from the worldwide leader in digital projection technology. Users get ultimate dependability, the most intuitive interfaces — and incredibly powerful tools for sharing their ideas with impact.

That means less maintenance. Fewer emergency calls. Perhaps even the occasional thank-you call. And more time to focus on what really matters.

People rely on you. You rely on InFocus.



The InFocus® LP540™ \$1599

Designed by a breakthrough engineer: you.

- Best-in-class capabilities
- Intuitive controls
- Brightness that lasts



The InFocus® X2™ \$999

All work. All play. All affordable.

- 3000-hour long-life lamp
- 1500 lumens for incredible brightness
- Outstanding digital video

InFocus® The Big Picture™

To find out more about InFocus or where to buy:

**call 1-888-InFocus or
visit www.InFocus.com**

mobileprofessional

Road Rules

Continued from page 1

GETTING IT RIGHT ON THE ROAD

"Road warrior" Lynette Tolson offers this advice: "I have neither the time nor inclination to fiddle with complicated technology tools, so user friendliness and reliability are both key for me. But you also need to be sure you can make maximum use of the technology you are carrying around."

And a few more tips
for making the most of
your technology and
time on the road:

» Never stay at a hotel lacking high-speed Internet access. Otherwise, a half-hour email session could turn into an all-night affair.

» When you are going to make a slide presentation, call ahead to see what kind of environment the presentation will take place in.

- What will the lighting be like?
- Are you projecting on a screen or a wall?
- How many people will be present?
- How big is the room?

» Always know in advance the location of an office services outlet. You never know when you'll need extra copies of handouts or other services—quickly.

INTERVIEW



Ron Gillies,
Senior Vice President and
General Manager for
NEC Solutions America, Inc.'s
Visual Systems Division

WHY CONSIDER NEC FOR YOUR DISPLAY TECHNOLOGY NEEDS?

NEC is a venerable, 100-year-old, \$43-billion global company and a true innovator in the manufacture of visual display technology. Supported by rock-solid engineering, our commercial and professional home entertainment projectors and plasma displays have won numerous awards for excellence. And we back all this up with industry-leading worldwide service and support, including our InstaCare repair and return and TravelCare loaner programs. We pride ourselves on taking great care of our customers.

WHAT IS NEC DOING TO ADDRESS THE TRENDS IN WIRELESS NETWORKS?

Wireless is truly exploding. IDC says that the number of public WiFi hotspots will double worldwide this year, while WiFi adoption in the enterprise continues. NEC's LT200 Series portable projectors include a wireless option enabling users to place their laptops anywhere in the room and switch seamlessly to the projector with the touch of a button for true collaborative communication. You can even remotely control and monitor the projector using the wireless function. It's no wonder NEC's LT240 was listed as a *PC World* Best Buy.

JUST HOW IMPORTANT IS MOBILITY?

IDC data shows that shipments of notebooks and projectors will continue to grow this year, while the US has one of the highest notebook and projector attach ratios in the world. This direct relationship, coupled with decreasing size and increases in functionality, makes notebooks and projectors the ideal combination for today's mobile professional.

NEC's 2.1-pound LT10 is a sleek, compact dynamo with the kind of stunning data and video display, superior brightness, and ease-of-use that empowers any on-the-road professional. These features also make the LT10 an ideal crossover projector for use both at work and home.

IT'S LIKE...
HAVING THOUSANDS OF
PEOPLE BEHIND YOU
REGARDLESS OF WHAT
LIES AHEAD.

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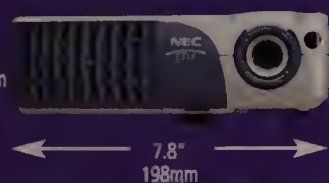
You deserve a display device whether it's in your home or at the office, that provides you with the highest level of image quality, simple operation and responsive global support to assist in times of need. NEC wants you to know that our commitment to quality products, award-winning service and to the environment is unmatched in the industry. For details on our robust line of projection and plasma display products, visit our web site at www.necvisualsystems.com or call 1.800.NEC.INFO (1.800.632.4636).



The name you trust. The reliability you deserve.

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NEC gives you the choices you need to succeed. Put your trust in an industry leader.



LT10. lightweight projector.

At a mere 2.1 lbs., the LT10 will easily slide into any carry-on. Packed with punch, including 1,100 ANSI lumens and DLP technology, your presentations are sure to impress the most critical of audiences.

The DLP™ logo and DLP™ medallion are trademarks of Texas Instruments.

\$100 rebate

LT10 end user mail in rebate
May 1-July 31, 2004.



LT220, LT240K, LT260K

LT260K. portable projector.

Bright enough for installation and light enough for travel, the powerful LT200 Series will make your ideas shine. With features including wireless or wired networking capabilities and extensive input options, it's no wonder NEC's LT240K was listed as a PC World Best Buy.

Empowered by Innovation

NEC

Lab-tested rankings of the best in PCs,
peripherals, and upgrade components

TOP 100

EDITED BY THE REVIEWS STAFF

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Spot LIGHT

Logitech's \$250 DiNovo Media Desktop (left), with its separate MediaPad, is our favorite Bluetooth input-device bundle. The \$65 Microsoft Basic Wireless Optical Desktop (right) is an affordable way to go wireless. Logitech's \$50 Cordless Click Plus Optical Mouse (bottom) provides lots of handy navigation options.



SPOTLIGHT: WIRELESS KEYBOARDS AND MICE

Walk on the Wireless Side

Think for a minute about the keyboard and mouse you use now. Are you happy with them? Perhaps you haven't given your input devices (or your hands) much consideration lately. But if you've been pounding away on your old keyboard and clicking the same mouse for several years, ask yourself if it's time to upgrade.

Wireless devices, which typically use radio frequency technology, are a great way to go for notebook and desktop PC users alike. With fewer cables,

your desk gets less cluttered. In particular, not having a cord makes mice easier to maneuver: You don't have to tug on tangled cables. And the newer wireless models offer a great array of customization options.

For this review, several *PC World* editors got their hands on eight different wireless devices and gave

them a workout. At least two editors tested each product to provide a range of opinions; because of the testers' different hand sizes, comfort





Advanced Digital Cameras

Top 10 CHART At \$1850, the Leica Digilux 2 is one of the most expensive cameras we've tested. However, it includes a unique bounce flash and a detachable lens hood.

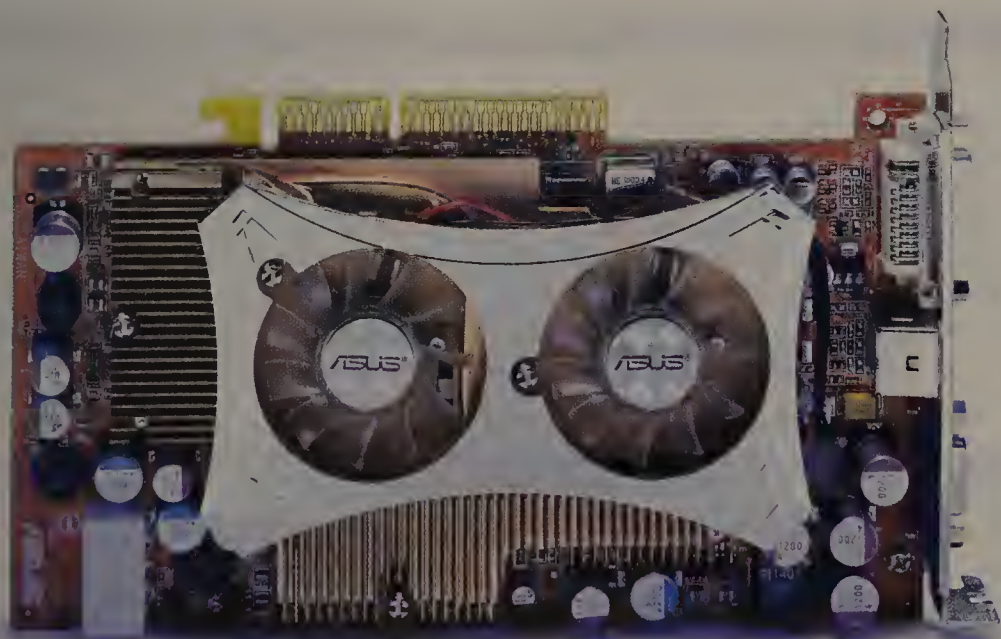
157

Inkjet Printers

Top 10 CHART Thanks to its ability to print beautiful, vibrant colors in photos—in addition to sharp text—Canon's i455 Desktop Photo Printer wins a Best Buy this month. Costing just \$80, it's a good bargain, too.



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Graphics Boards

Top 5 CHART The Asus Radeon 9800 XT keeps cool with the help of its two fans. Its high frame rates in our new gaming tests helped it land in the second spot on the chart this month.

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INSIDE THE TOP 100

See find.pcworld.com/15720 for details on how we compile our charts for the Top 100. Freelance writers Dan Littman and Carla Tharntan, and PC World editors Laura Blackwell, Eric Butterfield, Tracey

Capen, Kalpana Ettensan, Rebecca Freed, Alexandra Krasne, Melissa J. Perenson, and Alan Staffard contributed to the Top 100 section. Ulrike Diehlmann, Julia Gianabile, Elliott Kirschling, Jeff Kuta, Tony

K. Leung, and Thamas Luong of the PC World Test Center performed testing on the products that are reviewed in this section, with logistical support provided by Julian Weatherby.

levels, and individual tastes, reactions to some input devices varied considerably.

With some wireless packages, you get rid of all the cables on your desk: The RF receiver, which connects the keyboard and/or mouse to your PC, is a key chain-size adapter that plugs into your USB port. In other cases you use a wired-receiver or base station (for charging the mouse), which sits on your desk. RF key-

boards and mice must be no more than a few feet away from the receiver with a relatively clear line of sight to operate.

WHY BLUETOOTH?

A NEWER WAY to go wireless is with a keyboard and mouse that use Bluetooth. This technology allows your PC to talk to as many as seven Bluetooth-ready devices up to 30 feet away—and the devices don't

need to be in view of the base station or USB adapter to connect. However, Bluetooth keyboards and mice cost more than their RF counterparts. And during most of our tests, unfortunately, Bluetooth devices took longer to install, and some connections were occasionally shaky.

Our verdict? We picked one favorite in each of our three categories: wireless RF mouse, RF mouse-and-keyboard set, and

FEATURES COMPARISON

Cut the Cords: Wireless Input Devices

WIRELESS MICE		BLUETOOTH MICE AND KEYBOARDS	
			
Kensington Expert Mouse Wireless ★★★★★ Street price: \$120 find.pcworld.com/41756	Logitech Cordless Click Plus Optical Mouse ★★★★★ Editor's PICK Street price: \$50 find.pcworld.com/41752	Microsoft Wireless Optical Mouse ★★★★★ Street price: \$45 find.pcworld.com/41750	Belkin Bluetooth Wireless Optical Mouse ★★★☆☆ Street price: \$80 find.pcworld.com/41758
Features			
Mouse: • Trackball pointing device • Right- and left-click buttons (both programmable) • Two additional programmable buttons • Circular scroll wheel surrounding the ball • For right- and left-handed people • Includes a detachable wrist rest	Mouse: • Scroll wheel with zoom and side-to-side scrolling options • Right- and left-click buttons • Forward and Back buttons (both programmable) • Single <Alt>-<Tab> button (programmable)	Mouse: • Scroll wheel allows side-to-side movement on screen • Right- and left-click buttons (both programmable) • For right- and left-handed people • Arched shape • Available in four colors	Mouse: • Scroll wheel • Right- and left-click buttons (both programmable) • Back button for Web navigation located under thumb • Pronounced curve where thumb sits
Comments			
TRACKBALL DEVOTEES WILL appreciate this wireless member of the Expert Mouse family, which feels a lot like Kensington's wired trackballs. All buttons are customizable, and it's simple to make configuration changes for lefties. This is the priciest pointing device we've tested. The large ball, buttons, and scroll wheel are easy to locate, but for small-handed folk not necessarily easy to manipulate. The design forces your hand to bend up. The wrist rest helps, but may be too shallow or short for people with big hands. UPSHOT: If you like trackballs, you'll love this model; but since it feels very different from a mouse, it isn't for everyone.	INSTALLING THIS MOUSE was simple—unlike some packages, no software is needed. You do install software to customize the buttons, though. The Forward and Back buttons came in handy for moving through Windows folders, presentations, and Web pages. The scroll wheel's additional zoom functions worked great on digital images and unwieldy spreadsheets. This right-hander's mouse is slightly larger than most, so testers with small hands found it somewhat uncomfortable. UPSHOT: Good for fans of big, wide, and contoured mice; the additional scroll-wheel functions are pluses.	MICROSOFT'S MOUSE IS bulkier than most we've used, making it better for people with big hands. Testers liked how the symmetrically contoured design provided grooves that fit thumbs and pinkies well. The scroll wheel worked as advertised—side to side, plus up and down—but the default setting with accelerated scrolling tended to be jerky. Testers with small hands found that the pronounced hump under the palm forced their hands into a slightly uncomfortable position; the wrist rest helped. UPSHOT: Nice if you like a choice of colors—and don't need extra buttons. Ideal for people with larger hands.	BELKIN'S LARGE MOUSE (for right-handed users) has three customizable buttons. It offers a responsive scroll wheel, and testers found the Back button easy to reach while moving through Web pages. The mouse's cursor movement was generally smooth. However, one tester—after the mouse had sat inactive for a while—noticed a lag in the device's response. The same tester had to reactivate the Bluetooth connection several times. People with very small hands may find the mouse too large. UPSHOT: A fairly inexpensive way to turn your PC into a Bluetooth hub. Connections were sometimes flaky during tests.

Bluetooth input devices. In general our favorites all felt comfortable to use, and they provided plenty of easy-to-implement programmable options.

Microsoft's \$65 Basic Wireless Optical Desktop, our favorite RF set, comes with 25 programmable buttons at a nice price. Our pick for RF mouse is Logitech's \$50 Cordless Click Plus Optical Mouse, largely because of its great navigation features.

Our favorite Bluetooth package is Logitech's \$250 DiNovo Media Desktop. It comes with a detached numeric keypad, which worked great as a remote control for music files. However, the DiNovo has a steep price, and the keyboard and mouse in our tests took a few seconds to respond every time the PC booted, a common Bluetooth characteristic. Unless you need a Bluetooth hub for other devices,

such as a PDA or printer, we recommend RF instead. (See find.pcworld.com/41489 for reviews of all input devices tested.)

Sure, your current keyboard and mouse work just fine, but you may find that a new wireless mouse or input-device duo makes your computing tasks more comfortable—and with all the customization options, they may even save you time.

—Aoife M. McEvoy ■

Visit find.pcworld.com/41489 for full reviews of the products below, as well as reviews of more mice and keyboards.



WIRELESS MOUSE-AND-KEYBOARD SETS

Logitech DiNovo Media Desktop



★★★★☆

Street price: \$250

find.pcworld.com/40856

Features

Mouse:

- Scroll wheel
- Right- and left-click buttons
- Up and Down scroll buttons
- Dedicated <Alt>-<Tab> button
- Forward and Back buttons

Keyboard:

- 4 programmable buttons
- Volume, mute, media player buttons
- Separate MediaPad

Comments

THE LOW-LYING keyboard felt like a large laptop keyboard, thanks to its flatness. Keys were light and firm to the touch, and comfortable for most reviewers. Installing the package took some time.

The keyboard's and mouse's customizable buttons were useful, and the <Alt>-<Tab> button on the mouse was handy. Mouse and keyboard response lagged initially after the PC's boot-up. Left-handers won't be able to use the mouse.

The MediaPad accesses multimedia files and works as a remote device.

UPSHOT: If you're a Bluetooth fan—and you like quick access to your music and video—the pricey DiNovo fits the bill.

Gyration Ultra GT Full-Size Keyboard Suite

★★★★☆

Street price: \$100

find.pcworld.com/41748

Mouse:

- Allows in-air mousing
- Scroll wheel
- Right- and left-click buttons (both programmable)
- For right- and left-handed people
- Additional button on underside

Keyboard:

- 15 programmable buttons
- Palm rest

ALL 15 KEYBOARD buttons are customizable; you get a whopping 60 choices.

The keyboard lives up to its advertised range—testers typed up to 30 feet away. Keys had a spongy feeling; this sensation appealed to one tester, but not to others.

The mouse requires 9 hours of charging out of the box, and getting accustomed to it took a while: Waving the device around felt peculiar, and its skinny shape was difficult to grip. One tester experienced some connection issues each time the computer booted up.

UPSHOT: If you want to mouse in three dimensions, or compute from the couch, the Gyration may be ideal.

Logitech Cordless Desktop Express

★★★★☆

Street price: \$50

find.pcworld.com/41746

Mouse:

- Scroll wheel
- Right- and left-click buttons (both programmable)
- For right- and left-handed people

Keyboard:

- 4 programmable buttons
- Volume and mute buttons
- Palm rest

LOGITECH'S KEYBOARD PROVIDES dedicated buttons for the Windows Calculator, any e-mail program, and any Web page, along with a back-button key for Web navigation; all are programmable.

The keys felt soft, but testers still got a good response. Logitech makes creating a secure connection between the keyboard and the receiver easy.

You can customize the mouse's three buttons—you get 30 options. The small unit has a gentle curve, and it is comfortable for small- and large-handed users.

UPSHOT: This \$50 set is the cheapest way to go wireless, but the keyboard offers relatively few programmable keys.

Microsoft Basic Wireless Optical Desktop



★★★★☆

Street price: \$65

find.pcworld.com/41687

Mouse:

- Wide scroll wheel with horizontal cursor acceleration
- Right- and left-click buttons
- For right- and left-handed people

Keyboard:

- 25 programmable buttons
- Volume and mute buttons
- Calculator, Log-off, and Sleep buttons
- Alternative uses for all function buttons

YOU CAN CHANGE the keyboard's defaults on its 25 buttons to open any app, carry out a command, or jump to any Web page—or you can disable each key entirely. All function keys have secondary options, such as Open, Close, and Print; these are also programmable.

The keys are nicely spaced and firm; as you type, you get a slight clicking sound.

The mouse was comfortable but sparsely furnished: You get a scroll wheel, along with noncustomizable right- and left-click options, and that's it.

UPSHOT: Perfect for someone who wants an affordable wireless set with lots of keyboard customization options.

TOP 15 DESKTOP PCs

POWER SYSTEM		Overall rating	Street price (4/2/04)	PC WorldBench 4 performance score ¹	Faster	Comments
1	Best BUY ABS Ultimate M5-64 find.pcworld.com/41186	90	Inexpensive \$2319	Windows XP Home Outstanding 142		PC delivers top-notch performance at a bargain price, plus a strong selection of software; bundled CRT is bulky. (★★★★★ May 04)
2	HP Compaq Presario 8000Z find.pcworld.com/41740	87	Inexpensive \$2328	Windows XP Professional Outstanding 141		Housed in a svelte midsize tower, this newly configured 8000Z sped through our tests; but it lacks drive bays to boost storage. (★★★★★)
3	Sys Technology Performance 3400+/64 find.pcworld.com/40397	86	Average \$2522	Windows XP Professional Outstanding 141		One of the fastest machines we've tested, this industrial-black Sys comes with a fantastic-sounding audio system. (★★★★★ Apr 04)
4	MPC Millennia 920i Creative Studio find.pcworld.com/41153	86	Expensive \$3398	Windows XP Professional Good 127		PC comes with great speakers and a sleek LCD. The software bundle is geared toward photo and video enthusiasts. (★★★★★ May 04)
5	Polywell Poly 900NF3-FX53 find.pcworld.com/41528	83	Expensive \$3499	Windows XP Professional Outstanding 146		This loaded tower was our top performer; funky, almost demonic black "gaming" chassis has a flimsy door. (★★★★★ May 04)
6	Gateway 710X Performance find.pcworld.com/41736	83	Inexpensive \$2400	Windows XP Home Good 127		The matching LCD on this silver-and-black midsize tower produced sharp text at all font sizes. (★★★★★)
7	Dell Dimension 8300 find.pcworld.com/20574	83	Average \$2697	Windows XP Home Good 128		Well-equipped to handle media, this 8300 has a 250GB hard drive, a fine 19-inch LCD monitor, and a great sound system. (★★★★★ May 04)
VALUE SYSTEM		Overall rating	Street price (4/2/04)	PC WorldBench 4 performance score ¹	Faster	Comments
1	Best BUY Dell Dimension 4600 find.pcworld.com/40406	88	Inexpensive \$1089 ⁷	Windows XP Home Good 123		This well-appointed Dell offers fine performance for its configuration; it includes an attractive LCD and good speakers. (★★★★★ Apr 04)
2	EMachines T3085 find.pcworld.com/41734	86	Average \$1198	Windows XP Home Very good 129		Strong performer (except on graphics tests) can handle most tasks, but the dark, fuzzy LCD makes doing them a chore. (★★★★★)
3	Dell Dimension 2400 find.pcworld.com/41174	86	Very inexpensive \$699 ⁸	Windows XP Home Good 115		A large CRT monitor and a generous, home-oriented software bundle highlight this bargain system. (★★★★★ May 04)
4	Gateway 510XL find.pcworld.com/41738	85	Expensive \$1500	Windows XP Home Good 125		Well-rounded machine can handle basic text and spreadsheet documents, as well as multimedia presentations. (★★★★★)
5	Sony VAIO PCV-RS530G find.pcworld.com/40478	83	Very expensive \$1900	Windows XP Home Very good 126		Sony's media PC is loaded with amenities for watching and recording television, playing music, and working with images. (★★★★★ Apr 04)
6	HP Pavilion A450e find.pcworld.com/41525	82	Expensive \$1725	Windows XP Home Good 124		Fine performance, a plethora of USB 2.0 and FireWire ports, and a great monitor grace this home or office PC. (★★★★★ May 04)
7	Polywell Poly 900VF find.pcworld.com/40004	80	Average \$1195	Windows XP Home Very good 136		This was the fastest PC on our value list at running productivity applications, but graphics performance was disappointing. (★★★★★ Mar 04)
8	Shuttle Computer XPC K6200 find.pcworld.com/41744	75	Expensive \$1499	Windows XP Home Good 117		The XPC's compact size is appealing, though there's little room for upgrades. The monitor's plastic sheen caused glare. (★★★★★)

Go to find.pcworld.com/10860 for details on PC World's Star Ratings.

Go to find.pcworld.com/39209 for a breakdown of the weightings we give to the various factors that contribute to a desktop PC's overall rating in each of the two categories.

¹ Performance word scores reflect comparisons of PCs in the same category (power or value) running the same operating system. See find.pcworld.com/15720 for more details.

² Total capacity in gigabytes (may represent multiple drives).

IN A PC MARKET DEVOTED PREDOMINATELY to tower cases, from miniature to gargantuan, Shuttle Computer carved out a niche—highly compact computers the size and shape of a shoebox. Previously, the company targeted the do-it-yourself market by selling the chassis with just a power supply and a mini-ITX motherboard preinstalled. The buyer had to supply all other components (see *Next Gear* on page 127 for more on a build-your-own Shuttle PC). Now Shuttle Computer is moving into the

mass market with its first fully configured systems—one of which debuts in eighth place on our value list.

Priced at \$1499, the Shuttle XPC K6200 combines attractive form with modest function. Measuring just 11 by 6.7 by 7.5 inches, it need not end up stashed under a desk; it fits nicely on a convenient shelf or in another out-of-the-way nook. Equipped with a 2.8-GHz Pentium 4

Visit find.pcworld.com/41760 for reviews of all products tested this month and ranked in this chart.

CPU	RAM (MB/type)	Hard drive ²	Monitor	Graphics	Case type ³	Optical drives	Other features ⁴	Graphics quality	Setup and ease of use	Vendor's reliability/service
2.2-GHz Athlon 64 3400+	1024/DDR400 SDRAM	160 (RAID)	19-inch CRT	256MB ATI Radeon 9800 XT	Tower	8X DVD±RW and 16X DVD-ROM drives	Flash media reader, ⁵ gigabit ethernet, Logitech Z-680 5.1 speakers, Microsoft Works 7, Half-Life Platinum Edition; no modem	Very good	Outstanding	Good/ ⁶
2.2-GHz Athlon 64 3400+	1024/DDR400 SDRAM	160 (RAIO)	17-inch LCD	256MB ATI Radeon 9600 Pro	Midsized tower	8X DVD±RW and 48X CD-RW drives	Microsoft Works 7, Money 2004, MSN Encarta Plus	Very good	Good	Fair/Poor
2.2-GHz Athlon 64 3400+	1024/DDR400 SDRAM	240 (RAIO)	17-inch LCD	128MB PNY Verto GeForce FX 5700 Ultra	Midsized tower	8X DVD±RW drive	Flash media reader, ⁵ Creative Inspire T7000 speakers, no modem, Microsoft Office 2003 Small Business Edition	Outstanding	Good	'/'
3.2-GHz Pentium 4	1024/DDR400 SDRAM	320 (RAIO)	19-inch LCD	256MB NVIDIA GeForce FX 5950	Midsized tower	8X DVD±RW and 52X CD-RW drives	Logitech Zip 750 drive, Microsoft Wireless Multimedia Keyboard, Microsoft Office XP Small Business Edition, Pinnacle Studio, Roxio PhotoSuite 5SE	Outstanding	Outstanding	Good/ ⁶
2.4-GHz Athlon 64 FX-53	1024/DDR400 SDRAM	148.6 (RAIO)	19-inch CRT	256MB NVIDIA GeForce FX 5950 Ultra	Midsized tower	8X DVD±RW drive and 52X CD-RW/16X DVD-ROM combo drive	Flash media reader, ⁵ TV tuner card with remote, Creative Inspire T7700 speakers, no modem, Ulead VideoStudio 7, Ulead DVD MovieFactory 2.5	Good	Good	'/'
3.2-GHz Pentium 4	1024/DDR400 SDRAM	250	17-inch LCD	256MB NVIDIA GeForce FX 5950 Ultra	Midsized tower	8X DVD±RW and 16X DVD-RM drives	Flash media reader, ⁵ Microsoft Works Suite 2004, Pinnacle Expressions 2	Very good	Good	Good/Fair
3.2-GHz Pentium 4	1024/DDR400 SDRAM	250	19-inch LCD	128MB ATI Radeon 9800 Pro	Midsized tower	8X DVD±RW and 48X CD-RW drives	Oell 5650 speakers, Dell's Productivity Pack (includes Corel WordPerfect 11 and Microsoft Money 2004), Jasc Paint Shop Pro 8, Sonic MyOVO	Very good	Very good	Good/Fair

CPU	RAM (MB/type)	Hard drive ²	Monitor	Graphics	Case type ³	Optical drives	Other features ⁴	Graphics quality	Setup and ease of use	Vendor's reliability/service
2.8-GHz Pentium 4	512/DDR400 SDRAM	120	17-inch LCD	128MB NVIDIA GeForce FX 5200	Minitower	16X DVD-ROM and 48X CD-RW drives	Corel WordPerfect Productivity Pack, Microsoft Money 2003, Quicken 2003 New User Edition	Good	Good	Good/Fair
2.167-GHz Athlon XP 3000+	512/DDR333 SDRAM	160	17-inch LCD	Integrated NVIDIA GeForce4 MX graphics	Minitower	8X DVD±RW and 52X CD-RW drives	Flash media reader, ⁵ Microsoft Works 7, Microsoft Money 2004, Encarta Online	Poor	Very good	Good/Good
2.67-GHz Pentium 4	256/DDR333 SDRAM	80	19-inch CRT	Integrated Intel 845GL graphics using main memory	Minitower	16X DVD-RM and 48X CD-RW drives	Microsoft Works Suite 2003, Sonic MyOVO, Britannica 2003, Quicken 2002, Jasc Paint Shop Pro 8, Dell A425 speakers	Poor	Very good	Good/Fair
3-GHz Pentium 4	512/DDR400 SDRAM	160	15-inch LCD	128MB NVIDIA GeForce FX 5200G	Minitower	8X DVD±RW and 16X DVD-RM drives	Flash media reader, ⁵ Microsoft Works Suite 2004, Pinnacle Expressions 2	Fair	Good	Good/Fair
3.2-GHz Pentium 4	512/DDR400 SDRAM	160	15-inch LCD	128MB ATI Radeon 9200	Minitower	8X DVD±RW and 16X DVD-ROM drives	Flash media reader, ⁵ TV tuner card with remote, Giga Pocket PVR hardware and software, Microsoft Works 7	Very good	Fair	Good/Fair
2-GHz Athlon 64 3200+	1024/DDR400 SDRAM	200	17-inch LCD	128MB NVIDIA GeForce FX 5600	Minitower	8X DVD±RW and 16X DVD-ROM drives	Flash media reader ⁵	Very good	Good	Fair/Fair
2-GHz Athlon 64 3200+	512/DDR400 SDRAM	BD	17-inch CRT	128MB NVIDIA GeForce FX 5200	Midsized tower	16X DVD-ROM and 52X CD-RW drives	Brushed-aluminum case with side-panel window and neon light, wireless keyboard and mouse, games; no modem	Good	Good	'/'
2.8-GHz Pentium 4	512/DDR333 SDRAM	100	17-inch LCD	Integrated ATI Radeon 9100IGP	Compact	8X DVD±RW drive	Logitech Cordless Elite keyboard, Logitech X-220 speakers, Microsoft Works Suite 2004	Fair	Fair	'/'

³ Vertical cases are towers (over 20 inches), midsized towers (15.5 to 20 inches), or minitowers (under 15.5 inches). Compacts are small-footprint or thin horizontal cases.

⁴ Unless otherwise stated, systems come with a modem and a 10/100 network adapter.

⁵ Includes support for some combination of CompactFlash I/II, MultiMediaCard, Memory Stick, Memory Stick Pro, Secure Digital, SmartMedia, and XD-Picture Card.

⁶ Insufficient data to give a rating.

⁷ Use Dell E-Value code 6V411-460RPW to get this price.

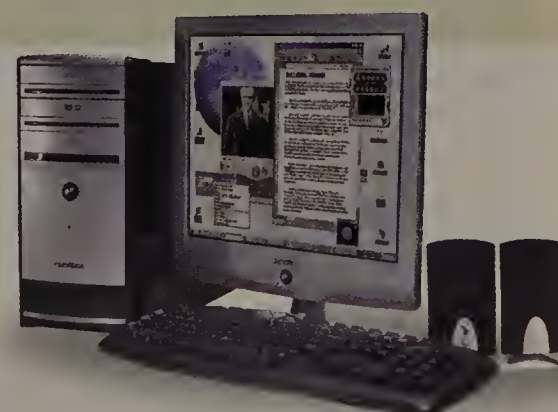
⁸ Use Dell E-Value code 6V411-D24REV to get this price.

processor, 512MB of DDR333 SDRAM, and integrated ATI Radeon 9100IGP graphics, the XPC K6200 turned in a PC WorldBench score of 117—slightly below the average mark posted by systems with this processor that we've tested, though more than adequate for basic computing needs. It also earned mediocre graphics performance scores—typical of PCs with integrated graphics that rely on main

memory. (For more on this system's design, see *Tech Trend* on page 146.)

All that said, we're fond of Shuttle's PCs. Evaluated strictly on price and features, they may not be the best value on the chart. But they have a more subjective appeal: Their compact size and portability give them a coolness quotient that is hard to quantify.

We also tested the XPC K6200's ►



EMACHINES' T3085 proved itself a strong overall performer for the price.

more powerful sibling, the \$3049 XPC G2 7500. With a fast, 3.4-GHz Pentium 4 CPU, 1GB of DDR400 SDRAM, and an ATI Radeon 9800 XT graphics card, the G2 7500 has the processing muscle for space-conscious power users, plus the high graphics performance sought by gamers headed to LAN parties. Even so, this model missed our chart: Compared with other contenders on the power list, it has fewer features, is dramatically less expandable, and is at the upper end of the price range for the group. With this system you pay a premium for compact appearance and portability.

NEWCOMERS APLENTY

TWO OTHER systems, from EMachines and Gateway, join the XPC K6200 on the value list this month. Carrying the same price as Shuttle's XPC K6200, the Gateway 510XL we tested was faster, and it had a larger hard drive, a second optical

drive, a flash media reader, and a Creative sound card instead of integrated sound. The only spec in which the Shuttle outclassed the Gateway was monitor size: The Gateway came with a 15-inch LCD versus the Shuttle's 17-inch model.

The number two-ranked EMachines T3085 served up terrific overall performance (for a value PC) on our PC WorldBench 4 tests; its score of 129 was a dozen points better than the Shuttle's. This system has much to offer home and business users, including a 160GB hard drive and integrated flash media reader slots. But not everything hit the mark: The T3085 has a mediocre 17-inch LCD monitor and a puny two-speaker set.

Physically, the black-and-silver EMachines system resembles the Gateway 510XL, but there are some significant differences. The EMachines costs about \$300 less than the Gateway but has integrated graphics that delivered slower

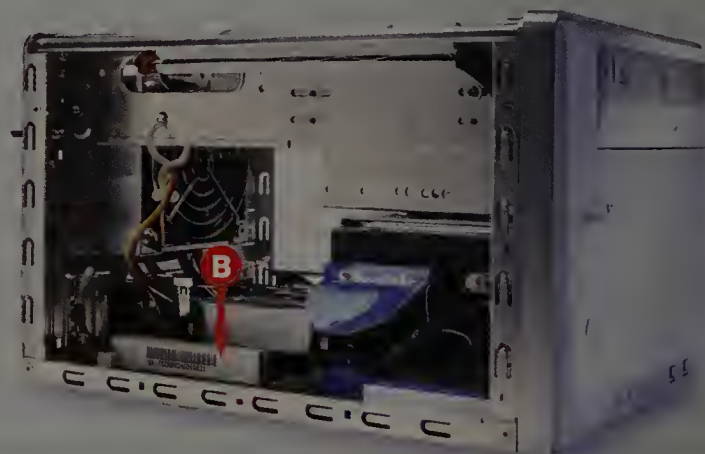
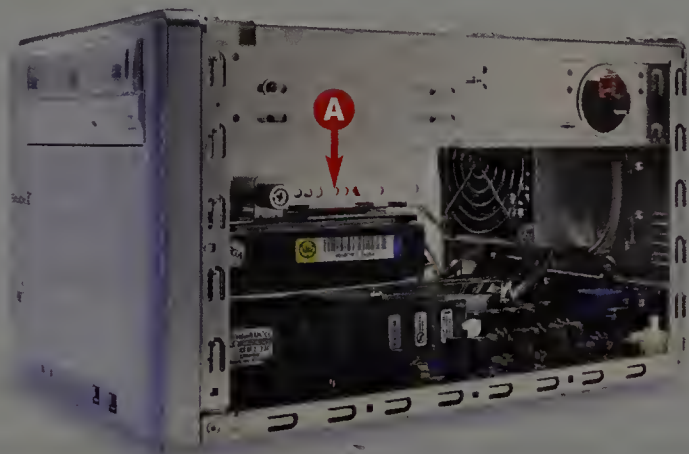
frame rates than the Gateway's NVidia GeForce FX 5200G-based graphics card.

New to our power desktops list this month are updated configurations from HP and Gateway. The \$2328 HP Compaq Presario 8000Z debuts in second place, thanks to its combination of outstanding performance (it scored a 141 on our PC WorldBench 4 tests) and a comparatively low price. The previous 8000Z model featured a different processor and cost more due to the inclusion of a flash media reader and a software bundle containing Corel WordPerfect Office 11 (instead of Microsoft Works 7).

The \$2400 Gateway 710X Performance wasn't as speedy as the Compaq 8000Z (lagging by 14 points on PC WorldBench 4 tests). But the 3.2-GHz Pentium 4-based Gateway system does have its high points: It includes a whopping 250GB hard drive and offers plenty of bays and slots for future upgrades. ■

TECH TREND

Anatomy of a Compact System: Shuttle XPC K6200



LIMITED EXPANDABILITY IS perhaps the greatest drawback of a small PC like the Shuttle. For instance, the system has just one 3.5-inch drive bay (A), to hold either an extra hard drive or a flash media card drive, and one 5.25-inch bay, used in this example by the included 8X DVD±RW drive.

Furthermore, unlike a comparatively behemoth tower system—which typically has several bays and PCI slots available—the XPC K6200 has only one free PCI slot (B) to accommodate add-in

cards. And the motherboard has no AGP slot, so you won't be able to upgrade its graphics later.

In spite of its small size, the Shuttle case does supply a selection of pertinent connectors on the back, including two each of USB 2.0 and FireWire ports (C); VGA, serial, and 10/100 ethernet ports; line-in, line-out, and microphone jacks; and PS/2 and keyboard ports. The unit also has two front-accessible USB ports (D), as well as a second set of audio jacks.





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TOP 15 NOTEBOOK PCs

DESKTOP REPLACEMENT		Overall rating	Street price (3/19/04)	PC WorldBench 4 performance score ¹ 	Comments
1	Best BUY HP Compaq Nc6000 find.pcworld.com/41093	82	Expensive \$2099	Windows XP Professional Very good 125	Lightweight corporate notebook comes with dual wireless capabilities and great battery life. (★★★★☆ May 04)
2	Gateway 450XL find.pcworld.com/38528	81	Expensive \$2169	Windows XP Professional Very good 125	An unremarkable exterior conceals top-notch features such as built-in Wi-Fi, very good battery life, and upgradability. (★★★★ Dec 03)
3	Dell Inspiron 5150 find.pcworld.com/41147	78	Average \$1679	Windows XP Home Good 115	This notebook has a high-resolution screen. It's hefty, however, and you can't remove its optical drive to swap in a second battery. (★★★★☆ May 04)
4	EMachines M6807 find.pcworld.com/41063	78	Inexpensive \$1649	Windows XP Home Outstanding 128	The first notebook we've tested that has a Mobile Athlon 64 CPU whips through applications and piles on the features. (★★★★ May 04)
5	HP Pavilion Zx5001 find.pcworld.com/41870 NEW	73	Expensive \$2073	Windows XP Home Good 107	Wide-screen notebook has a top-of-the-line design, but it's dragged down by mediocre performance. (★★★☆☆)
ALL-PURPOSE NOTEBOOK		Overall rating	Street price (3/19/04)	PC WorldBench 4 performance score ¹ 	Comments
1	Best BUY IBM ThinkPad R50 find.pcworld.com/40025	82	Average \$1724	Windows XP Home Very good 117	Well-rounded, affordable laptop turned in strong performance and has long battery life and a great keyboard. (★★★★★ Mar 04)
2	Dell Latitude D505 find.pcworld.com/41144	81	Inexpensive \$1357	Windows XP Professional Good 111	Business portable delivered lackluster performance; its sleek modular optical drive has a built-in release. Drops \$263 this month. (★★★★☆ May 04)
3	IBM ThinkPad T41 find.pcworld.com/39476	81	Expensive \$2064	Windows XP Professional Very good 123	Eraserhead and mouse buttons feel a bit flimsy and the battery is awkward to remove, but the overall design is still pleasing. (★★★ Feb 04)
4	Toshiba Satellite M35 find.pcworld.com/40439	80	Inexpensive \$1649	Windows XP Home Very good 118	Reasonably priced wedge-shaped model allows comfortable typing and displays graphics beautifully on its 15.4-inch screen. (★★★★☆ Apr 04)
5	Toshiba Satellite A45-S250 find.pcworld.com/41872 NEW	79	Inexpensive \$1599	Windows XP Home Good 111	Ergonomically friendly portable allows easy typing; carries twice as many USB ports as most notebooks, along with useful audio controls. (★★★★☆)
ULTRAPORTABLE		Overall rating	Street price (3/19/04)	PC WorldBench 4 performance score ¹ 	Comments
1	Best BUY Toshiba Portégé M100 find.pcworld.com/38870	81	Average \$1749	Windows XP Professional Good 115	Sporty notebook combines a good keyboard, solid performance, strong audio, and long battery life. Drops \$500 this month. (★★★★☆ Jan 04)
2	IBM ThinkPad X31 find.pcworld.com/39512	80	Average \$1678 ²	Windows XP Professional Good 116	This near-perfect small notebook's only flaw: The optical drive is located in a separate \$199 docking station. (★★★★★ Feb 04)
3	Fujitsu LifeBook P5020 find.pcworld.com/39482	76	Average \$1899	Windows XP Professional Good 107	Relatively compact for a portable with a modular bay, the P5020 has a small screen. (★★★★☆ Feb 04)
4	Dell Latitude X300 find.pcworld.com/38531	76	Expensive \$2306 ²	Windows XP Professional Good 116	On its own, this portable is just 3 pounds; its 1.9-pound media slice adds a full set of connections and great sound. (★★★ Dec 03)
5	Panasonic CF-W2 Toughbook find.pcworld.com/39515	75	Average \$1995	Windows XP Professional Fair 105	Light, hardy little notebook has a unique top-mounted optical drive but a cramped keyboard, and it skimps on other features. (★★★★☆ Jan 04)

Go to find.pcworld.com/10860 for details on PC World's Star Ratings. Go to find.pcworld.com/40049 for a breakdown of the weightings we give to the various factors that contribute to a notebook's overall rating in each of the three categories.

¹ See "Your Guide to the Top 100" at find.pcworld.com/15720 for more details.

² Except where noted, all Intel CPUs are SpeedStep chips, which run at a slower speed on battery power. (We performance-test all notebooks plugged in.)

³ Features listings are not exhaustive.

⁴ Unless otherwise noted, all notebooks come with a lithium ion battery.

⁵ Includes computer, AC adapter, power cord, optical drive, and floppy drive (if offered).

HEWLETT-PACKARD'S LATEST multimedia notebook makes a successful run for the desktop replacements section of our chart, landing in the fifth spot. Though it suffers from sluggish performance compared with other desktop replacements, the Zx5001 does have one unique feature: A proprietary bay can accommodate HP's USB Digital Drive, which holds SD

memory cards. The USB device comes with a cover to protect the SD card.

Our other chart newcomer, Toshiba's Satellite A45-S250, showed phenomenal battery life in our lab tests—almost 7 hours on one charge. Though that long charge probably sounds great if you travel

Visit find.pcworld.com/41874 for reviews of all products tested this month and ranked in this chart.

CPU ²	Screen (inches)	RAM (MB)	Hard drive (GB)	Pointing device	Bays and optical drives	Other features ³	Overall design	Battery life (hours:min) ⁴	Average weight (pounds) ⁵	Vendor's reliability/service
1.6-GHz Pentium M	14.1	512	60	Touchpad, eraserhead	One multipurpose bay with DVD-ROM and CD-RW combo drive	802.11a/g, gigabit ethernet, SD slot, embedded security chip	Very good	Outstanding/ 6:23	Light/ 6.6	Fair/Fair
1.7-GHz Pentium M	15.1	512	60	Touchpad	One multipurpose bay with DVD-ROM and CD-RW combo drive	802.11g, six-in-one media card reader, Microsoft Works 7	Very good	Very good/ 4:59	Average/ 8.1	Good/Good
3.06-GHz Pentium 4-M	15.0	512	60	Touchpad	Fixed DVD+R/RW drive	802.11g, WordPerfect Productivity Suite	Average	Good/ 4:02	Very heavy/ 10.3	Good/Fair
1.8-GHz Mobile Athlon 64 3000+	15.4	512	60	Touchpad	Fixed DVD-R/RW/+R/RW drive	802.11g, six-in-one media card reader, Microsoft Works 7	Good	Fair/ 2:49	Heavy/ 9.1	‘/’ ⁶
3.06-GHz Pentium 4-M	15.4	512	80	Touchpad	Fixed DVD+R/RW drive	802.11g, five-in-one media card reader	Very good	Fair/ 2:19	Very heavy/ 10.4	Good/Poor
CPU ²	Screen (inches)	RAM (MB)	Hard drive (GB)	Pointing device	Bays and optical drives	Other features ³	Overall design	Battery life (hours:min) ⁴	Average weight (pounds) ⁵	Vendor's reliability/service
1.4-GHz Pentium M	14.1	512	40	Touchpad, eraserhead	One multipurpose bay with DVD-ROM and CD-RW combo drive	802.11b, S-Video-out	Outstanding	Good/ 4:04	Light/ 6.5	Good/Good
1.2-GHz Celeron M	15.0	256	40	Touchpad	One multipurpose bay with DVD-ROM and CD-RW combo drive	802.11b	Good	Very good/ 4:45	Average/ 7.1	Good/Fair
1.6-GHz Pentium M	14.1	512	40	Touchpad, eraserhead	One multipurpose bay with DVD-ROM and CD-RW combo drive	802.11b, Bluetooth, gigabit ethernet	Good	Good/ 4:19	Light/ 5.9	Good/Good
1.4-GHz Pentium M	15.4	512	60	Touchpad	Fixed DVD-ROM and CD-RW combo drive	802.11b, SD slot	Good	Good/ 3:47	Average/ 7.1	Good/Fair
2.8-GHz Pentium 4-M	15.0	512	60	Touchpad	Fixed DVD-R/RW/+R/RW drive	802.11g, SD slot, Microsoft Works 7	Good	Outstanding/ 6:51	Heavy/ 9.3	Good/Fair
CPU ²	Screen (inches)	RAM (MB)	Hard drive (GB)	Pointing device	Bays and optical drives	Other features ³	Overall design	Battery life (hours:min) ⁴	Average weight (pounds) ⁵	Vendor's reliability/service
1.2-GHz Pentium M	12.1	256	40	Eraserhead	One multipurpose bay with DVD-ROM and CD-RW combo drive	802.11g	Very good	Good/ 4:11	Light/ 5.3	Good/Fair
1.3-GHz Pentium M	12.1	512	20	Eraserhead	DVD-ROM and CD-RW combo drive ⁸	802.11b, CompactFlash slot	Very good	Very good/ 4:49	Light/ 6.4	Good/Good
1-GHz Pentium M	10.6	256	60	Touchpad	One multipurpose bay with DVD-ROM and CD-RW combo drive	802.11b, SD and CompactFlash slots	Good	Good/ 4:15	Very light/ 4.7	‘/’ ⁶
1.2-GHz Pentium M	12.1	640	40	Touchpad	DVD-ROM and CD-RW combo drive ⁸	802.11g, SD slot	Very good	Fair/ 2:07	Light/ 6.0	Good/Fair
900-MHz ULV Pentium M	12.1	256	40	Touchpad	Fixed DVD-ROM and CD-RW combo drive	802.11b, SD slot	Fair	Outstanding/ 7:00	Very light/ 3.7	‘/’ ⁶

⁶ Insufficient data to give a rating.

⁷ Price includes the extra-cost docking station.

⁸ Multipurpose bay is in docking station.

with a notebook frequently, it might not be enough to convince you to pack the Toshiba in your overnight bag—it tips the scales at more than 9 pounds.

The two other notebooks we looked at missed the cut. IBuyPower's Battalion 101 S, dressed in a bright blue case, has a

3.2-GHz desktop P4 CPU that pushed it to a PC WorldBench 4 score of 118. Unfortunately, it struggled through our battery tests, lasting just 1 hour and 49 minutes. Acer's TravelMate 291 was even faster, and it fared well in our battery tests, but its design is bare-bones. ■

HP'S Pavilion Zx5001 includes a five-in-one media card reader.



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TOP 10 PRINTERS

Visit find.pcworld.com/41888 for reviews of all products tested this month and ranked in this chart.

WE REVISED OUR TEST DOCUMENTS this month, and retested all previously tested inkjet printers. Our Best Buys—the HP Deskjet 5150 and Canon i455—printed glossy pics that rivaled the output of pricier six-color photo printers. The three Canon models printed the sharpest text and line art.

Our testing changes resulted in slower text speeds for some previously tested printers. One noteworthy new product missed the chart: HP's Deskjet 450wbt. This mobile, Bluetooth model printed very impressive glossy photos—but at \$350 it was too expensive to earn a place on the chart.

	INKJET PRINTER	Street price (3/26/2004)	Overall rating	Speed for text/color graphics (ppm)	Print quality for text/color graphics	Color cartridge cost/yield ¹	Comments ²
1	Best BUY HP Deskjet 5150 find.pcworld.com/39197	\$100	95	4.6/1.5	Good/ Good	\$35 ³ /400	FEATURES: Rated 6.8 ppm monochrome/4.6 ppm color. 4800-by-1200-dpi maximum resolution, 150 sheets input, 50 output; black cartridge and one tricolor cartridge. SUMMARY: Printed sharp text, well-defined line art, and detailed color photos. Optional duplexer. Retested this month. (★★★★☆)
2	Best BUY Canon i455 Desktop Photo Printer NEW find.pcworld.com/41812	\$80	93	5.3/0.9	Very good/ Very good	\$18/170	FEATURES: Rated 18 ppm monochrome/12 ppm color. 4800-by-1200-dpi maximum resolution, 100 sheets input, 50 output; black cartridge and one tricolor cartridge. SUMMARY: On photo paper, pictures looked excellent; even on plain paper colors looked vibrant and details were sharp. (★★★★☆)
3	Canon i350 Color Bubble Jet Printer find.pcworld.com/39191	\$60	93	5.4/0.7	Very good/ Good	\$18/170	FEATURES: Rated 16 ppm monochrome/11 ppm color. 4800-by-1200-dpi maximum resolution, 100 sheets input, 50 output; black cartridge and one tricolor cartridge. SUMMARY: Impressive prints with deep-black text and detailed photos. Slow at printing graphics. Retested this month. (★★★★☆)
4	Lexmark Z615 NEW find.pcworld.com/41816	\$50	90	4.3/0.5	Good/ Good	\$32/Not provided	FEATURES: Rated 14 ppm monochrome/8 ppm color (draft). 4800-by-1200-dpi maximum resolution, 100 sheets input, 25 output; black cartridge and one tricolor cartridge. SUMMARY: Printed more-attractive glossy photos than the Lexmark Z715. Colors looked light on plain paper. (★★★☆☆)
5	Canon i475D Desktop Photo Printer find.pcworld.com/38174	\$100	90	5.3/0.9	Very good/ Very good	\$18/580	FEATURES: Rated 18 ppm monochrome/12 ppm color. 4800-by-1200-dpi maximum resolution, 100 sheets input, 50 output; black cartridge and one tricolor cartridge. SUMMARY: Includes flash memory slots. Printed crisp text and attractive gray-scale images. Retested this month. (★★★★☆)
6	HP Business Inkjet 1100d find.pcworld.com/38177	\$200	87	4.1/1.8	Good/ Good	\$34/1750	FEATURES: Rated 7.5 ppm monochrome/7 ppm color. 4800-by-1200-dpi maximum resolution, 150 sheets input, 80 output; black cartridge and three color cartridges. SUMMARY: Duplexer included. Printed sharp text, crisp line art, and attractive color photos. Retested this month. (★★★★☆)
7	HP Deskjet 5850 find.pcworld.com/39200	\$250	87	4.5/1.5	Good/ Good	\$35 ³ /400	FEATURES: Rated 7.7 ppm monochrome/5 ppm color. 4800-by-1200-dpi maximum resolution, 150 sheets input, 50 output; black cartridge and one tricolor cartridge. SUMMARY: Print speed was on a par with the Deskjet 5150's, but this model offers Wi-Fi and ethernet. Retested this month. (★★★★☆)
8	Epson Stylus C84 find.pcworld.com/38171	\$99	86	5.2/1.6	Good/ Fair	\$13/450	FEATURES: Rated 22 ppm monochrome/12 ppm color. 5760-by-1440-dpi maximum resolution, 120 sheets input, 50 output; black cartridge and three color cartridges. SUMMARY: Printed sharp text and attractive color photos, but line art showed banding. Retested this month. (★★★★☆)
9	Epson Stylus C64 find.pcworld.com/39362	\$59	85	2.5/0.7	Good/ Fair	\$13/400	FEATURES: Rated 17 ppm monochrome/9 ppm color. 5760-by-1440-dpi maximum resolution, 120 sheets input, 30 output; black cartridge and three color cartridges. SUMMARY: Inexpensive but quite slow. Glossy photos lost subtle details, and text had rough edges. Retested this month. (★★★★☆)
10	Lexmark Z715 NEW find.pcworld.com/41818	\$80	83	4.7/0.5	Fair/ Good	\$38 ³ /Not provided	FEATURES: Rated 17 ppm monochrome/10 ppm color (draft). 4800-by-1200-dpi maximum resolution, 100 sheets input, 25 output; black cartridge and one tricolor cartridge. SUMMARY: Glossy photos looked dark and reddish. The less-expensive Lexmark Z615 printed sharper text. (★★★☆☆)

FOOTNOTES: ¹ Vendor-estimated page yield per cartridge; average page yield given for printers with multiple cartridges. ² Speed ratings are for normal mode, unless otherwise noted.

³ Optional photo ink cartridge costs \$25. **HOW WE TEST:** We run time tests for text, line-art, color graphics, and photo samples. Data based on tests designed and conducted by the PC World Test Center. All rights reserved. See find.pcworld.com/10860 for details on PC World's Star Ratings. **CHART NOTES:** The overall rating for each inkjet printer is based on price (25 percent), print quality (25 percent), ease of use (15 percent), features (15 percent), speed (10 percent), and support (10 percent). Listed text speed is the average time required to print a text document and spreadsheet in different quality modes; graphics speed is the average of the speeds for printing graphics from various applications in color and gray scale.

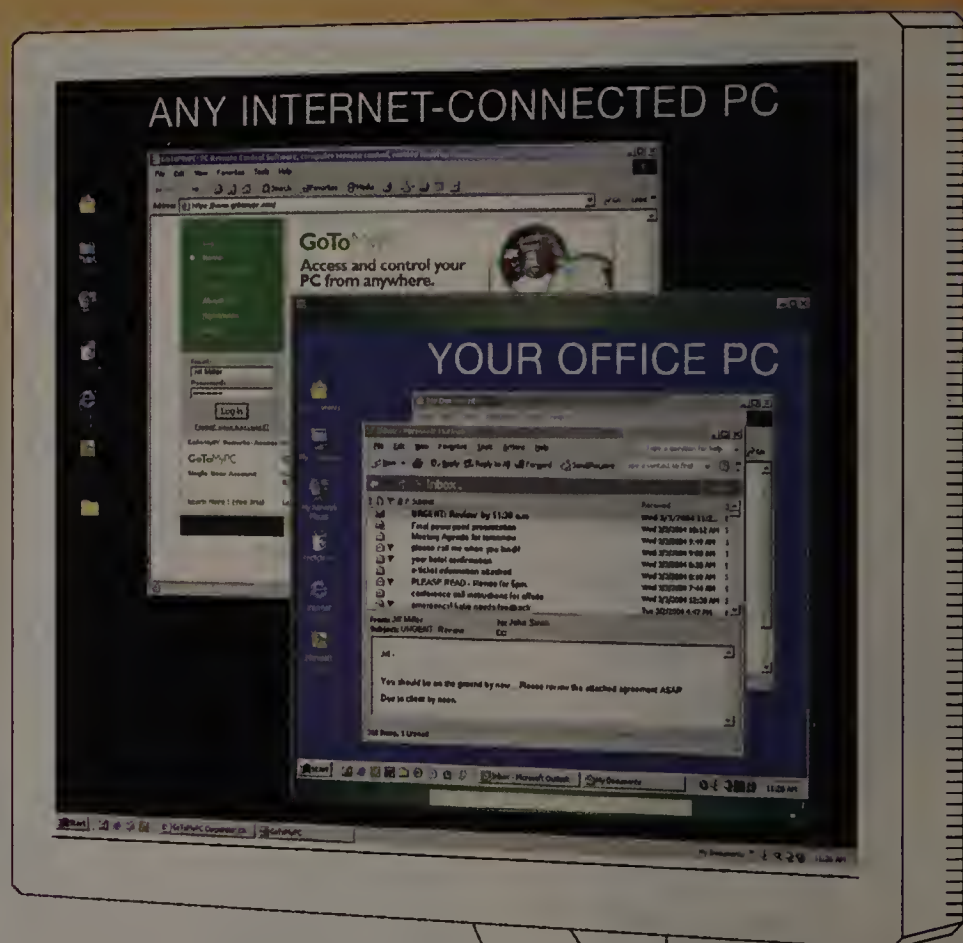
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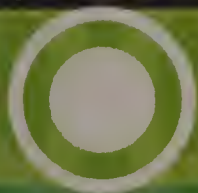
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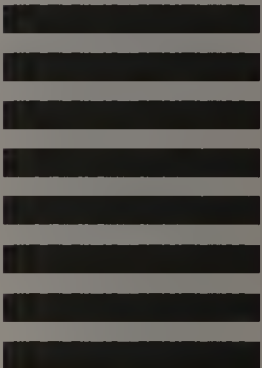
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TOP 10 DVD DRIVES

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Visit find.pcworld.com/42056 for reviews of all products tested this month and ranked in this chart.

THIS MONTH'S CHART IS PACKED with drives that can manage both DVD-R and DVD+R writes at 8X. Seven of the ten drives—including a trio of newcomers from AOpen, Lite-On, and TDK—support the faster speed. We also retested the Sony DRU-530A, which we first evaluated as part of our April

2004 DVD roundup. This time, we used a newer firmware version, available as a free download from Sony's Web site. This upgrade adds 8X DVD-R and 4X DVD-RW capabilities to the drive; in addition, it boosts DVD+R write performance by 22 percent over the previous firmware version.

	REWRITABLE DVD DRIVE	Street price (3/29/04)	Overall rating	Performance	Write performance (min:sec) ¹	Comments
1	Best BUY Plextor PX-708A find.pcworld.com/38396	\$185	87	Outstanding	• DVD+R 8:21 • DVD+RW 9:03 • CD-R 3:02	FEATURES: Internal IDE drive, 8X DVD+R, 4X DVD+RW, 4X DVD-R, 2X DVD-RW, 40X CD-R, 2M8 buffer; Roxio Easy CD & DVD Creator 6.1 (with Drag-to-Disc and DVD Builder), PhotoSuite 5 SE, and DVDMax Player; 11-hour weekday toll-free support. SUMMARY: The speediest drive on the chart overall by a small margin; can also write at 8X with some brands of 4X DVD+R media. (★★★★☆ Apr 04)
2	Best BUY TDK External Indi DVD 840G 8x Multiformat find.pcworld.com/40475	\$280	87	Outstanding	• DVD+R 8:22 • DVD+RW 9:02 • CD-R 3:02	FEATURES: External USB 2.0 and FireWire drive, 8X DVD+R, 4X DVD+RW, 4X DVD-R, 2X DVD-RW, 40X CD-R, 2M8 buffer; Roxio Easy CD & DVD Creator 6.1 (with Drag-to-Disc and DVD Builder), PhotoSuite 5 SE, DVDMax Player, and Toast Lite (for Mac); 10-hour daily toll-free support. SUMMARY: Attractive, dual-interface external drive nearly matches the Plextor in speed and features. (★★★★ Apr 04)
3	Kano Technologies K8Xtreme find.pcworld.com/40472	\$150	87	Very good	• DVD+R 9:36 • DVD+RW 8:52 • CD-R 3:40	FEATURES: Internal IDE drive, 8X DVD+R, 4X DVD+RW, 8X DVD-R, 4X DVD-RW, 32X CD-R, 2M8 buffer; Roxio Easy CD & DVD Creator 6.1 (with Drag-to-Disc and DVD Builder); 11-hour weekday toll-free support. SUMMARY: Ties the TDK 88DN as the fastest drive on the chart at burning to rewritable media; also writes to some brands of 4X-rated DVD-R media at 8X speed. (★★★★☆ Apr 04)
4	Lite-On LDW-812S find.pcworld.com/41850 NEW	\$150	87	Very good	• DVD+R 9:18 • DVD+RW 9:09 • CD-R 3:14	FEATURES: Internal IDE drive, 8X DVD+R, 4X DVD+RW, 8X DVD-R, 4X DVD-RW, 40X CD-R, 2M8 buffer; Sonic MyDVD 4.5, RecordNow DX 4.60, and DLA 3.6D, CyberLink PowerDVD XP 4.0; 24-hour daily toll-free support. SUMMARY: Reasonably priced drive is a strong performer; software bundle is a couple of versions behind (upgrades are free downloads from the Lite-On site). (★★★★)
5	Memorex True 8X Dual Format DVD Recorder find.pcworld.com/40424	\$180	84	Very good	• DVD+R 8:30 • DVD+RW 11:52 • CD-R 4:22	FEATURES: Internal IDE drive, 8X DVD+R, 4X DVD+RW, 8X DVD-R, 4X DVD-RW, 24X CD-R, 2M8 buffer; Ahead Nero Memorex Special Suite (with Nero Vision 2.1, Nero Express 6.3, InCD 4.1, Media Player, BackItUp, and ReCode 2); 9-hour weekday toll-free support. SUMMARY: Supports 8X burning on both +R and -R, but its rewrite performance was one-third slower than our leader's. (★★★★☆ Apr 04)
6	TDK Internal Indi DVD 8x+/8x- Multiformat Burner 880N find.pcworld.com/41852 NEW	\$180	84	Very good	• DVD+R 9:48 • DVD+RW 8:52 • CD-R 3:41	FEATURES: Internal IDE drive, 8X DVD+R, 4X DVD+RW, 8X DVD-R, 4X DVD-RW, 40X CD-R, 2M8 buffer; Roxio Easy CD & DVD Creator 6.1 (includes Drag-to-Disc and DVD Builder), PhotoSuite 5 SE, and DVDMax Player; 10-hour daily toll-free support. SUMMARY: This model was nearly 1.5 minutes slower at writing to DVD+R than the second-ranked TDK 84DG, but it also does 8X writes to DVD-R. (★★★★)
7	Pioneer DVR-A07 find.pcworld.com/40421	\$175	83	Very good	• DVD-R 8:23 • DVD+RW 9:32 • CD-R 4:46	FEATURES: Internal IDE drive, 8X DVD+R, 4X DVD+RW, 8X DVD-R, 4X DVD-RW, 24X CD-R, 2M8 buffer; Ulead MovieFactory 3 SE, BurnNow 1, VideoStudio 7 SE, Photo Explorer 8, and DVD Player, NovaStor Nova Backup 7.1; 9-hour weekday toll-free support. SUMMARY: A versatile software bundle rounds out this drive's comparable DVD-R and DVD+R performance; but CD-R speed lagged. (★★★★☆ Apr 04)
8	AOpen 8X DVD+/- RW Burner (DRW8800) find.pcworld.com/41846 NEW	\$140	83	Very good	• DVD+R 9:33 • DVD+RW 11:51 • CD-R 3:38	FEATURES: Internal IDE drive, 8X DVD+R, 4X DVD+RW, 8X DVD-R, 4X DVD-RW, 32X CD-R, 2M8 buffer; MedioStream NeoDVD 4.5, Ahead Nero Burning ROM 5.5, InCD 4.1, CyberLink PowerDVD 5, Ulead VideoStudio 7 SE; 9-hour weekday toll-free support. SUMMARY: Has an array of software for editing and authoring DVDs; but its rewrite performance was one-third slower than the TDK 840G's. (★★★★)
9	Benq DW800A find.pcworld.com/40445	\$150	83	Very good	• DVD+R 8:31 • DVD+RW 9:15 • CD-R 4:11	FEATURES: Internal IDE drive, 8X DVD+R, 4X DVD+RW, 24X CD-R, 8M8 buffer; InterVideo WinDVD Creator Plus 2, Sonic RecordNow 6.5 and DLA 4.50, Benq Book-type Management and OVideo; 12-hour weekday toll-free support. SUMMARY: One of the least-expensive drives on the chart, it worked quickly when burning DVDs, but to one format only; CD performance was a bit slow. (★★★★☆ Apr 04)
10	Sony DRU-530A find.pcworld.com/40451	\$165	83	Very good	• DVD+R 8:31 • DVD+RW 9:20 • CD-R 3:17	FEATURES: Internal IDE drive, 8X DVD+R, 4X DVD+RW, 8X DVD-R, 4X DVD-RW, 40X CD-R, 2M8 buffer; Sonic MyDVD 5 LE, RecordNow 6.7, and DLA 4.5, CyberLink PowerDVD 5; 12-hour weekday plus Saturday toll-free support. SUMMARY: A free firmware upgrade added 8X/4X DVD-R/RW burning and improved this model's DVD+R performance by 22 percent. Retested this month. (★★★★)

FOOTNOTE: ¹ We test the drives with the format specified by the vendor at review time. Write speed is the time (in minutes:seconds) to write 4.35GB to DVD using the drive's bundled mastering software, to format a blank rewritable DVD disc and copy 2.64GB of data to that disc, and to write 700MB of data to a CD-R. **HOW WE TEST:** We test drives under Windows XP Home on PCs with 1.67-GHz Athlon XP 200D+ CPUs and 512MB of SDRAM, using media supplied by the vendor or Verbatim. Some vendors may change drive suppliers without changing their model designations; our results reflect the configuration tested at review time. **CHART NOTES:** Overall rating is based on performance (35 percent), price (25 percent), features (15 percent), ease of installation (15 percent), and support policies (10 percent). All drives have a one-year warranty unless otherwise noted. See find.pcworld.com/10860 for details on PC World's Star Ratings.

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TOP 5 GRAPHICS BOARDS

TOP 100

TEST
Center

Visit find.pcworld.com/42080 for more information on products ranked in this chart.

	AGP BOARD	Street price (4/1/04)	Overall rating	Image quality	Overall speed	Features rating	Comments
1	Best BUY MSI FX5900 XT-VTD128 NEW find.pcworld.com/41994	\$200	82	Very good	Good	Very good	FEATURES: BX AGP, NVidia GeForce FX 5900 XT chip, 128MB of OOR SDRAM, DVI-out, dual-display support, 350-MHz RAMDAC; three bundled games. SUMMARY: Pretty good performance, desirable features such as DirectX 9 support, and a nice price give this board the top spot on the chart. (★★★★☆)
2	Asus Radeon 9800 XT NEW find.pcworld.com/41942	\$437	79	Outstanding	Very good	Outstanding	FEATURES: 8X AGP, ATI Radeon 9800 XT chip, 256MB of DDR SDRAM, DVI-out, dual-display support, 400-MHz RAMDAC; two bundled games. SUMMARY: Impressive image quality, features, and performance make this pricey Radeon 9800 XT-based card a great choice for serious gamers. (★★★★☆)
3	ATI All-In-Wonder 9600 XT NEW find.pcworld.com/41940	\$250	78	Outstanding	Satisfactory	Very good	FEATURES: 8X AGP, ATI Radeon 9600 XT chip, 128MB of OOR SDRAM, FM receiver, DVI-out, dual-display support, 400-MHz RAMDAC. SUMMARY: Midrange card earned high marks for image quality and offers plenty of features; it lagged in the speed portion of our gaming tests, however. (★★★★☆)
4	Crucial Technology Radeon 9800 Pro 128MB find.pcworld.com/38075	\$335	77	Outstanding	Very good	Good	FEATURES: 8X AGP, ATI Radeon 9800 Pro chip, 128MB of OOR SDRAM, dual-display support, dual 400-MHz RAMDAC. SUMMARY: Despite having half the RAM and a price \$102 lower than that of the number-two Asus Radeon 9800 XT, this board rivals it in image quality and speed. (★★★★☆ Nov 03)
5	BFG Technologies Asylum GeForce FX 5950 Ultra NEW find.pcworld.com/41990	\$500	74	Very good	Very good	Good	FEATURES: 8X AGP, NVidia GeForce FX 5950 Ultra chip, 256MB of OOR SDRAM, DVI-out, dual-display support, 400-MHz RAMDAC. SUMMARY: Big, high-powered card takes up an extra slot and doesn't match some rivals in image quality, but it came out on top in our speed performance tests. (★★★★☆)

HOW WE TEST: We use 2.2-GHz Alienware PCs, each with an Athlon 64 FX-51 CPU, 1GB of OOR SDRAM, two 36.7GB Western Digital Raptor hard drives in SATA striped RAID0 configuration, and Windows XP Home. For performance testing, we use the games Halo, Splinter Cell Pandora Tomorrow, and Wolfenstein Enemy Territory, an Unreal Tournament 2004 demo, and a Comanche 4 benchmark game demo. We measure frame rates at 1024 by 768 and 1600 by 1200 resolutions, both using 32-bit color. We also perform image-quality tests with 4X antialiasing and 8X anisotropic filtering enabled at 1024 by 768 with 32-bit color using Wolfenstein Enemy Territory and the Unreal Tournament 2004 and Comanche 4 demos. Overall scores based on price (20 percent), performance (42.5 percent), features (27.5 percent), and service and support (10 percent). **CHART NOTE:** See find.pcworld.com/10860 for details on PC World's Star Ratings.

GRAPHICS BOARDS SPORTING the new and faster PCI Express interface may be appearing in PCs by the time you read this. But if you want to upgrade a fairly recent system—and aren't interested in buying a new motherboard to take advantage of PCI Express—check out our latest chart of AGP 8X contenders. Four of the five models are new; they

not only showed plenty of speed in our gaming tests, but they have loads of nongaming features, as well.

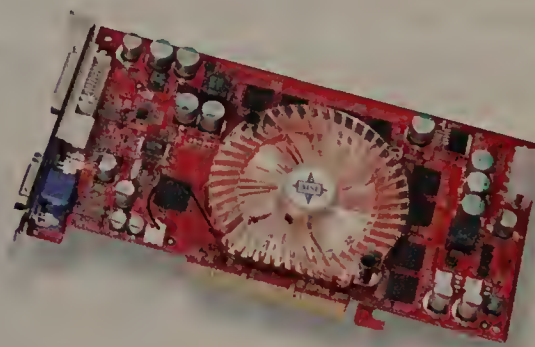
For gamers with money to burn, Asus's Radeon 9800 XT and BFG Technologies' Asylum GeForce FX 5950 Ultra hit high frame rates in our new gaming tests using the games Halo, Splinter Cell Pandora Tomorrow, Wolfenstein Enemy Territory, Unreal Tournament 2004, and Comanche 4. In antialiasing image-quality tests using Wolfenstein Enemy Territory, Unreal Tournament 2004, and Comanche 4, ATI-based cards impressed our panel of judges and earned higher scores than the NVidia-based cards.

For gamers who can't afford the high-end models, the top card, MSI's FX5900 XT-VTD128, offers good gaming performance for the money. It also bundles full versions of the games Duke Nukem: Manhattan Project; Tom Clancy's Ghost Recon; and The Elder Scrolls III: Morrowind. All of the cards we reviewed support the latest DirectX 9 API.

But these new boards have plenty of features to make nongamers drool, too. ATI's All-In-Wonder 9600 XT, number three on the chart, offers a remote control, the ability to record and play back live TV and FM radio, dual-display support, and a host of other niceties at a relatively

low price of \$250. And, with ATI's optional VGA-to-YPrPb adapter, you can use this card to drive an HDTV-ready TV set. Asus's Radeon 9800 XT card includes a security application that protects your PC by detecting motion, capturing video, and sending out e-mail warnings.

And finally, all of the graphics boards we reviewed for this chart proved easy to install on our new Athlon 64 FX-51-based Alienware test systems. ■



MSI'S FX5900 XT-VTD128 earned high marks for its image quality and feature set, and its low price is hard to beat.

PHOTOGRAPH: RICK RIZNER



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C-8080 Wide Zoom

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- TruePic TURBO™ Image Processor
- QuickTime™ Movie Mode



Coolpix 8700

- 8.0 Megapixel
- 8x Optical Zoom
- 12 Scene Modes



PowerShot Pro 1

- 8.0 Megapixel
- 28-200mm L-series USM Zoom Lens
- 7x Optical Zoom



DSC-F828 Cyber-Shot®

- 8.0 Megapixel
- 7x Optical Zoom
- 5x Digital Zoom



DiMAGE XG Ultra-Thin

- 3.2 Megapixel
- 12x Non-Extending Zoom Lens
- 0.8 Second World's Fastest Start-Up Time



Coolpix 3200

- 3.2 Megapixel
- 3x Optical Zoom
- 4x Digital Zoom



D-580 Zoom

- 4.0 Megapixel
- 3x Optical Zoom
- 4x Digital Zoom



EasyShare CX7430

- 4.0 Megapixel
- 3x Optical Zoom
- 4x Digital Zoom



FinePix A330

- 3.2 Megapixel
- 3x Optical Zoom
- 1.6x Digital Zoom



OLYMPUS \$95.00

256MB xD-Picture Card Model# XDPC256MB



Panasonic. \$186.00

512MB Secure Digital Card Model# RP-SDH512U1A



SONY. \$98.00

256MB Memory Stick Pro 160Mbps Model# MSX-256



SanDisk \$57.00

256MB Ultra II Compact Flash Card Model# SDCFH-256-901



OLYMPUS \$149.00

PT-018 Underwater Housing for Olympus C-740UZ & C-750UZ Digital Cameras



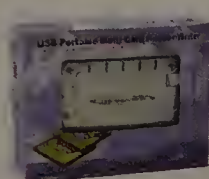
Canon \$22.00

Mini Tripod 7 T-0014 w/ Tilting Ball Head 2-Section Rubber Legs



BIOSTAR \$15.00

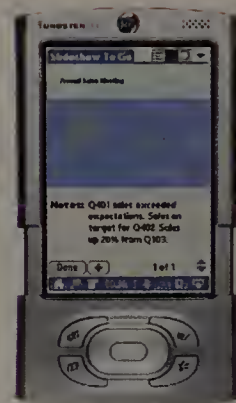
E-Catcher 6 in 1 Reader USB 1.1 Hot Swappable for Card Insertion & Removal



Hasei \$18.00

HR-206GTS USB 2.0 6 in 1 Reader/Writer for PC or MAC

Home Electronics



Tungsten T3

- Model# P80870US
- Intel XScale 400MHz
- 320x480 TFT @ 16-bit
- Palm OS v5.2.1
- Built-In Bluetooth

\$399.00



hp \$379.00

IPAQ Pocket PC H2215 Intel XScale 400MHz 240x320 TFT 64MB SDRAM Memory Microsoft Windows Pocket PC 2003 Premium



SONY \$266.50

Clie PEG-TJ37 200MHz i.MXL Processor 320x320 TFT @ 16-bit 32MB Memory Palm OS v5.2 Built-In Touch Screen



EPSON \$621.00

Stylus Photo 2200 Photo Printer 2880x1440 dpi Micro Piezo Ink Jet 126 Second 8x10 Photo



Canon \$199.00

i960 Photo Printer 4800x1200 dpi 2 Microscopic Picoliter Droplets 6 Individual Ink Tanks



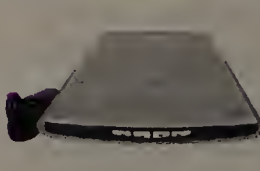
hp \$286.00

LaserJet 1150 Laser Printer 1200x1200dpi 18ppm Black 8MB Memory Model# Q1336A



KONICA MINOLTA \$750.00

Magicolor 2300DL Laser Printer 2400x600dpi 16ppm Black 4ppm Color Built-In Network & USB



Canon \$95.00

CanoScan LiDE 50 Color Scanner 1200x1200 dpi USB 2.0 48-Bit Color Depth Z-Lid™ Expansion Top



EPSON \$405.00

Perfection 4870 Photo Scanner 4800x9600 dpi USB 2.0 48-Bit Color Depth w/ Digital ICE™ Technology

TOP 10 DIGITAL CAMERAS

Visit find.pcworld.com/41890 for reviews of all products tested this month and ranked in this chart.

THE 8-MEGAPIXEL RACE IS ON: Canon, Nikon, and Olympus join Sony in offering high-end consumer models with 8-megapixel CCDs. So far the Olympus C-8080 is our pick of the group (we've yet to test the Canon PowerShot Pro1), with top-notch image-quality scores and easy-to-use controls.

Nikon's Coolpix 8700 produced photos as fine as the C-8080's and has a longer zoom range, but it's harder to use. In the "If you have to ask the price, you can't afford it" category, Leica's classic-looking Digilux 2 is designed for the purist photographer. Its unique feature: a built-in bounce flash.

	ADVANCED CAMERA	Street price (3/31/04)	Overall rating	Image quality	Ease of use	Battery life/shots	Comments ¹
1	Best Buy Olympus C-5060 Wide Zoom find.pcworld.com/39527	\$649	86	Outstanding	Very good	Outstanding/over 500 ²	FEATURES: 5.1-megapixel resolution, 32MB X0-Picture Card plus CompactFlash slot, 27mm to 110mm focal range, 640 by 480 video with audio, 17.9 ounces. SUMMARY: This model has extensive and intuitive exposure controls, and it earned top image-quality scores. Its LCO rotates up and swivels for self-portraits. (★★★★★ Feb 04)
2	Best Buy Canon EOS Digital Rebel find.pcworld.com/38810	\$1000	84	Very good	Very good	Outstanding/over 500 ²	FEATURES: 6.3-megapixel resolution, CompactFlash slot (media not included), 28mm to 90mm focal range, no video or audio recording, 29.5 ounces. SUMMARY: A bargain for a digital SLR camera with interchangeable lenses; though priced here as a kit with a midrange (3.2X) zoom lens, it is also sold body-only. (★★★★★ Jan 04)
3	Olympus C-8080 Wide Zoom NEW find.pcworld.com/41860	\$999	84	Very good	Very good	Outstanding/over 500 ²	FEATURES: 8-megapixel resolution, 32MB X0-Picture Card plus CompactFlash slot, 28mm to 140mm focal range, 640 by 480 video with audio, 25.6 ounces. SUMMARY: A step up from the less-expensive Best Buy C-5060, this model has a faster lens and slightly longer zoom range, but it is also considerably bulkier. (★★★★★)
4	Canon PowerShot G5 find.pcworld.com/37358	\$550	83	Very good	Good	Very good/438	FEATURES: 5-megapixel resolution, 32MB CompactFlash card, 35mm to 140mm focal range, 320 by 240 video with audio, 18 ounces. SUMMARY: Attractively priced for a camera with the G5's features, this big and boxy model earned high marks for image exposure accuracy. Lens casts a shadow in wide-angle flash shots. (★★★★★ Oct 03)
5	Nikon Coolpix 8700 NEW find.pcworld.com/41862	\$1000	82	Very good	Fair	Good/333	FEATURES: 8-megapixel resolution, CompactFlash slot (media not included), 35mm to 280mm focal range, 640 by 480 video with audio, 18.7 ounces. SUMMARY: An impressive upgrade of the Coolpix 5700. Nicely compact for a camera with an 8X optical zoom, and it creates fine photos, but the menus are still daunting. (★★★★★)
6	Sony Cyber-shot DSC-F828 find.pcworld.com/40802	\$1000	82	Very good	Very good	Outstanding/over 500 ²	FEATURES: 8-megapixel resolution, Memory Stick and CompactFlash slots, 28mm to 200mm focal range, 640 by 480 video with audio, 33.9 ounces. SUMMARY: The DSC-F828 uses Sony's new four-color CCO for more-vivid colors; our test shots looked great, but competing models earned higher image scores. (★★★★★ Apr 04)
7	Olympus C-5000 Zoom find.pcworld.com/39530	\$400	80	Very good	Very good	Fair/227	FEATURES: 5-megapixel resolution, 32MB X0-Picture Card, 38mm to 114mm focal range, 320 by 240 video without audio, 9.7 ounces. SUMMARY: Low-priced and relatively small for an advanced, 5-megapixel camera with a hot shoe, the C-5000 produced slightly better-than-average image quality in our tests. (★★★★★ Feb 04)
8	Fujifilm FinePix S7000 find.pcworld.com/40880	\$700	80	Very good	Very good	Good/304	FEATURES: 6.3-megapixel resolution, 16MB X0-Picture Card and CompactFlash slot, 35mm to 210mm focal range, 640 by 480 video with audio, 17.8 ounces. SUMMARY: This fairly easy-to-use camera turned out decent photos. Unlike many cameras on the chart, it relies on disposable batteries. (★★★★★ Apr 04)
9	Nikon Coolpix 5400 find.pcworld.com/37370	\$700	80	Good	Fair	Good/330	FEATURES: 5.1-megapixel resolution, 16MB CompactFlash card, 28mm to 116mm focal range, 640 by 480 video with audio, 13.7 ounces. SUMMARY: This unit has a wealth of features, but they're dauntingly presented. The Coolpix 5400 is relatively compact; however, the LCO is small for this class of camera. (★★★★★ Oct 03)
10	Leica Digilux 2 NEW find.pcworld.com/41868	\$1850	71	Very good	Good	Outstanding/over 500 ²	FEATURES: 5-megapixel resolution, 64MB SD card, 28mm to 90mm focal range, 320 by 240 video with audio, 25.8 ounces. SUMMARY: This camera's retro look gets attention. Though it's extremely pricey, it has a large, bright LCO and a unique bounce-flash feature. Fast aperture and zoom controls make it a pleasure to use. (★★★★★)

FOOTNOTES: ¹ Resolutions are expressed in effective pixels, focal range is identified as 35mm equivalent, and camera weights include batteries. ² We cut off testing at 500 shots, or approximately 4.5 hours of testing. **HOW WE TEST:** We take a series of shots, with and without flash, at the camera's highest resolution and at its default automatic settings. We photograph a complex still life and a mannequin to see how well each camera captures details and subtle colorings such as skin tones. A panel of judges reviews the on-screen and printed photos and assigns image-quality scores; we then average those scores. Data based on tests designed and conducted by the PC World Test Center. All rights reserved. **CHART NOTES:** Each camera's overall rating is based on price (20 percent), picture quality (30 percent), ease of use (10 percent), features (20 percent), battery life (10 percent), and support (10 percent). For all ratings, higher is better.

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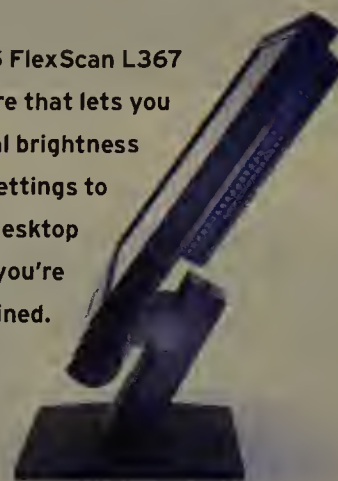
MISSED AN ISSUE OF *PC World* or passed your copy along to a friend? Here's a recap of other *Top 100* topics from previous issues. To read reviews of the products ranked on these Top 10 charts, go online and type in the *PC World* Find-It

URL at the top of each chart. Next month, we'll review PDAs, 17-inch LCD monitors, and rewritable DVD drives. Our Spotlight review will focus on digital projectors. In addition, look for a roundup review of the latest digital cameras.



FEED ME PHOTOS: The HP Scanjet 5530 Photosmart's integrated feeder accepts photo prints, not documents.

EIZO NANAOS FlexScan L367 comes with software that lets you assign individual brightness and contrast settings to each of your desktop applications, if you're so inclined.



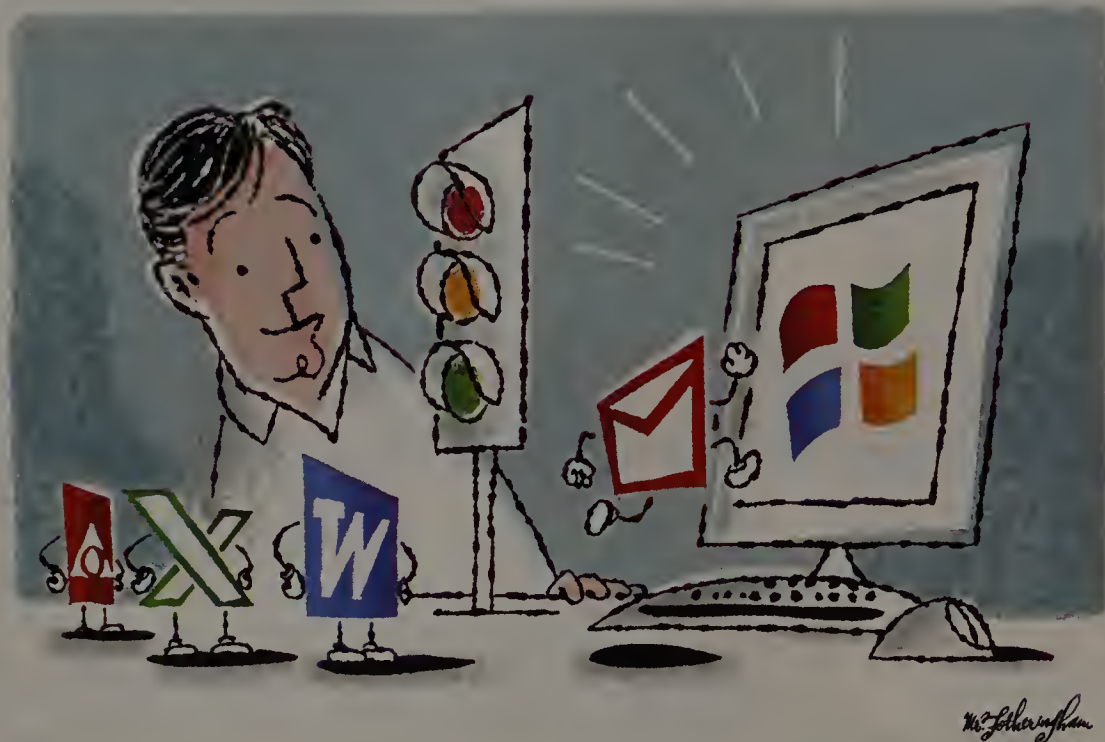
POINT-AND-SHOOT CAMERAS		15-INCH LCD MONITORS		SCANNERS		REWRTABLE DVD DRIVES	
find.pcworld.com/41498		find.pcworld.com/41363		find.pcworld.com/41579		find.pcworld.com/41537	
1	Best BUY Nikon Coolpix 3700 find.pcworld.com/40298	1	Best BUY Iiyama ProLite E380S-B find.pcworld.com/41198	1	Best BUY Canon CanoScan Lide 50 find.pcworld.com/37376	1	Best BUY Plextor PX-708A find.pcworld.com/38396
2	Best BUY Kodak EasyShare DX6440 find.pcworld.com/38795	2	Best BUY Eizo Nanao FlexScan L367 find.pcworld.com/41246	2	Microtek ScanMaker i320 find.pcworld.com/41543	2	Best BUY Lite-On LDW-811S find.pcworld.com/40463
3	Kodak EasyShare CX7430 find.pcworld.com/41348	3	Hewlett-Packard L1530 find.pcworld.com/41204	3	Visioneer OneTouch 9000 USB find.pcworld.com/29882	3	Kano Technologies K8Xtreme find.pcworld.com/40472
4	Toshiba PDR-5300 find.pcworld.com/40301	4	Dell UltraSharp 1504FP find.pcworld.com/41252	4	Epson Perfection 1670 Photo find.pcworld.com/37379	4	TDK External Indi DVD 840G 8x Multiformat find.pcworld.com/40475
5	HP Photosmart 945 find.pcworld.com/41264	5	Sharp LL-T15A4 find.pcworld.com/40805	5	HP Scanjet 5530 Photosmart find.pcworld.com/41546	5	Pacific Digital Mach-8 DVD Burner find.pcworld.com/40466
6	Sony Cyber-shot DSC-P10 find.pcworld.com/38468	6	NEC-Mitsubishi Multisync 1560NX find.pcworld.com/40808	6	Microtek ScanMaker 4900 find.pcworld.com/29124	6	Benq DW800A find.pcworld.com/40445
7	Kyocera Finecam L3v find.pcworld.com/38057	7	LG Electronics Flatron L1515S find.pcworld.com/41258	7	Visioneer OneTouch 7300 USB find.pcworld.com/41561	7	Memorex True 8X Dual Format DVD Recorder find.pcworld.com/40424
8	Pentax Optio 555 find.pcworld.com/38798	8	Philips 150P4 find.pcworld.com/41261	8	Best BUY HP Scanjet 8200 find.pcworld.com/37382	8	HP DVD Writer DVD400i find.pcworld.com/40454
9	Fujifilm FinePix F700 find.pcworld.com/38792	9	CTX International S500B find.pcworld.com/41333	9	Epson Perfection 4870 Photo find.pcworld.com/41564	9	Alera DVD Cruiser 8 Plus find.pcworld.com/40469
10	Minolta DiMage G500 find.pcworld.com/38786	10	Planar PE150M find.pcworld.com/41240	10	Microtek ScanMaker 8700 Pro Design find.pcworld.com/15843	10	Pioneer DVR-A07 find.pcworld.com/40421
From the May 2004 Issue		From the May 2004 Issue		From the May 2004 Issue		From the April 2004 Issue	

SMALL-OFFICE SCANNER

CORPORATE SCANNER

HERE'S HOW

EDITED BY MICHAEL S. LASKY, DENNIS O'REILLY, AND ERIC DAHL



WINDOWS TIPS

SCOTT DUNN

Make Windows Start and Stop the Way You Want

Windows 2K XP 98 ME WANT TO RUN AN application each time Windows starts? Easy. Just right-drag its .exe file, or a shortcut to that file, to the Startup folder and choose *Create Shortcut(s) Here*. The next time you start Windows, the program will load automatically. But what about scanning for viruses, making backups, defragmenting your hard drive, and doing other regular maintenance tasks? You don't want to wait for them to finish every time you start up.

The Scheduled Tasks feature in Windows can run those activities while you're away from your system—but only if you leave your computer on all the time. If you prefer to save power by shutting down your PC every day, tell Windows to do its chores just before it shuts down. Or even better, create a shutdown folder whose contents you can change at will, knowing that Windows will run the items in the folder when it shuts down.

This allows you to put the whammy on

applications that run uninvited at startup by constantly reinserting themselves into the Registry. First I'll show you how to add a shutdown folder to Windows without buying any additional software. Then I'll describe how to create a Registry file that wipes out unwanted entries every time you turn off your system. A batch file sent in by John F. Vogele of Santa Fe, New Mexico, inspired this tip.

First, create your shutdown folder. Note that launching items from a folder at shutdown works only with Windows 2000 and XP, so Windows 9x and Me users can skip this step and follow the instructions below for running programs at shutdown. To keep your shutdown folder with your Startup folder, right-click the *Start* button and click *Open*. Double-click *Programs* and then select *File • New • Folder*. Type **Shutdown** and press **<Enter>** to give the folder a name. Press **<Enter>** again to open the folder, and then fill it with shortcuts to any programs you want to run at shutdown: Use the right-mouse button to drag an item from any menu or folder window to your Shutdown folder and choose *Create Shortcut(s) Here* (in XP) or *Copy Here* (in 2000).

The programs start just before your computer powers down, so add only utilities and batch files that automatically shut down or stop their tasks when they finish (see **FIGURE 1**). To do this with disk maintenance utilities, you may need to set some special command-line switches; go to find.pcworld.com/41270 for details. Visit find.pcworld.com/41273 for tips on automating Disk Cleanup, too. You can also add a batch file that backs up your work or a shortcut that performs a virus scan. Consult your antivirus software for any necessary command-line options.

The names of the shortcuts in your

160 WINDOWS TIPS

Run maintenance tasks automatically at shutdown; delete pesky autostart programs by editing the Registry.

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Shake the cobwebs out of your Windows XP machine by giving the operating system a free tune-up.

170 INTERNET TIPS

Activate America Online's built-in pop-up blocker; load the version of AOL you prefer; e-mail reply etiquette.

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Move your data, settings, and programs from one PC to another; sort your IE Favorites alphabetically.



164

FIGURE 1:
SAVE TIME
at startup
by creating
a shutdown
folder that
runs utility
programs of
your choice
whenever
you exit
Windows.



Shutdown folder cannot contain any spaces. If you see a shortcut name that does have a space, select it, press **<F2>**, type a space-free name, and press **<Enter>**. Repeat as needed for all such shortcuts.

SHUTDOWN MAINTENANCE

NOW CREATE A BATCH file to launch these applications and shut down your computer. Select **Start•Programs (All Programs in XP)•Accessories•Notepad**. The first three lines of the batch file, which will launch the applications in your Shutdown folder, apply only to Windows 2000 and XP. On the first line, type **dir /b** followed by the path to your Shutdown folder (in quotation marks if it contains any spaces or long folder names). On the same line, type a space and **>** (the "greater than" symbol) followed by the path to the folder that will store the batch file, and finally a name for the batch file that lists your shutdown applications. To find the file path, simply open the folder in Explorer and look in the Address field. (If you don't see it there, click **Tools•Folder Options•View•Display the full path in the address bar**.) The **/b** switch in the command causes it to list only file names, without extra

information. For example, your first line might look like this: **dir /b "C:\Documents and Settings\Scott\Start Menu\Programs\Shutdown" > "c:\batch\run_it.bat"** (your paths may differ, of course).

On the second line, type **cd /d** and enter the path to the directory containing your Shutdown folder again. (The **/d** switch simply ensures that the prompt points to the correct drive.) For example, the second line of your batch file might look like this: **cd /d "C:\Documents and Settings\Scott\Start Menu\Programs\Shutdown"** (your path may differ, of course).

The next line will launch the batch file. Type a command like this: **call c:\batch\run_it.bat** (again, your path may differ).

In all Windows versions, add a line for each utility you want to launch that does not have a corresponding shortcut in your Shutdown folder. In Windows 9x and Me, this is the only way to get programs to launch just prior to Windows shutting down. For example, you might have a line like **c:\windows\scandiskw.exe c: d: /n** (your application and command-line options may differ, naturally). If you add Windows utilities that automatically exit upon completion, add **start /w** to the beginning of their lines, particularly if the tasks take a while. The **/w** switch causes the batch file to pause until the application has shut down before going to the next line.

Add a line to the batch file to shut down Windows. Browse to find.pcworld.com/41282 and scroll to "One-Click Exits and Reboots" for the full scoop. If you'd like to use Windows XP or 2000 to launch applications by putting them in your Shut-

down folder, adjust the **'-t'** (timeout) option to give these tasks enough time to finish before Windows shuts down. Type **-t**, followed by a space, and then enter the number of seconds you want the shutdown process to wait. For example, the command **-t 9999** will cause Windows to wait nearly 3 hours before shutting down. When you're done, your Notepad window may look like the one in **FIGURE 2**.

Now choose **File•Save**, navigate to the folder where you store batch files, and give your file a name with the **.bat** extension—for example, **Shutdwn.bat**. Next, open the folder in Explorer and drag the icon for the file you just saved onto the Start menu button. Click the **Start** button, right-click your new command, and select **Rename** (if you want to change its name) or **Properties** (if you want to customize its look via the Change Icon button on the Program or Shortcut tab). The next time you want to exit Windows and automatically run your shutdown applications, choose this icon on the Start menu instead of selecting the usual command.

STOP AUTOSTART APPS

Windows ONE HANDY USE for a shutdown folder is to clear persistent folderol from your Registry. Many apps try to keep themselves or one of their modules running in your system tray (the area near the clock) even when you're not using them. ►

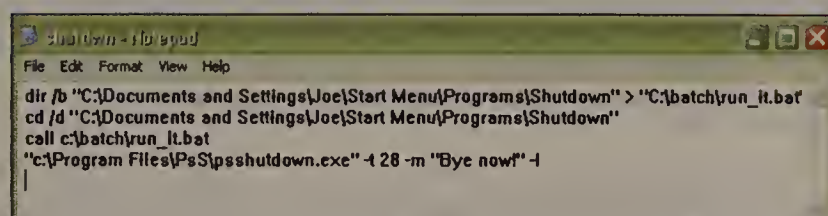
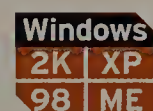


FIGURE 2: A SIMPLE BATCH FILE is the key to running utility programs and then shutting down Windows in a single step.

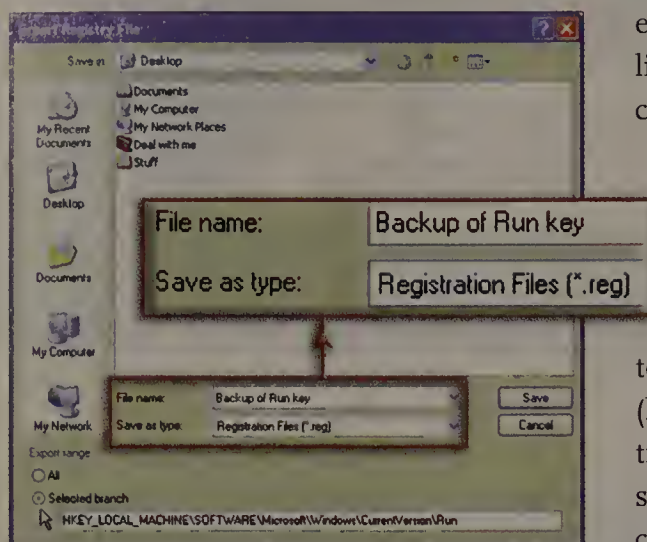


FIGURE 3: BACK UP REGISTRY segments that you'll edit, in case something goes awry.

Most of these Startup items are placed here when you first install the program. If you use them only occasionally, you can prevent them from starting by using a handy freeware tool such as Mike Lin's Startup Control Panel. Visit find.pcworld.com/41285 to download the program.

Unfortunately, some applications (such as QuickTime for Windows) restore their startup commands every time you upgrade or even just run the application. Before you can clean them out automatically, you need to edit the Registry key in question. Choose **Start•Run**, type **regedit**, and press **<Enter>**. Navigate to the folder (called a "key" in Registry lingo) containing the command to start the application. Startup Control Panel can show you where to look, but the most likely places are **HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Run** and **HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Run**. The QuickTime Task module, for example, uses the latter.

With the key selected in the tree pane on the left, choose **Registry•Export** or **File•Export** (depending on your version of Windows). Navigate to your backup fold-

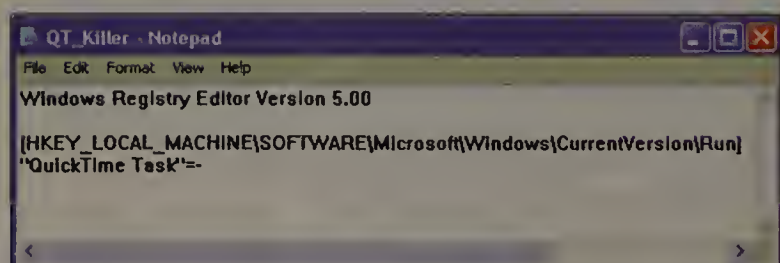


FIGURE 4: TO KEEP APPLICATIONS from starting, use a hyphen to delete entries when the Registry file is merged.

er, make sure that *Selected branch* is highlighted, give the export file a name, and click **Save** (see **FIGURE 3**).

Back in the Registry, choose the **Export** command again, but this time specify a folder for storing a modified version that you can use to delete unwanted Startup items. If you plan to make this correction via a batch file (like the one described in the previous tip), you may store this version in the same folder as your batch files. Again, confirm that *Selected branch* is highlighted, type a name, and click **Save**.

Open Explorer and locate the icon for the export file you just saved. Right-click the icon and choose **Edit**. Don't make any changes to the top line, the blank line below that, or the next heading line that shows the Registry path in brackets. Underneath that heading, one or more applications will be listed in quotation marks. Find the line that corresponds to the application whose startup command you would like to remove. Leave the line intact up to the equal sign (=), but delete everything on the line after that. Type a hyphen immediately after the equal sign. For example, if you're eliminating the QuickTime Task item, the line should now read **"QuickTime Task"=-**. Repeat these steps for all the applications you want to prevent from starting with Windows.

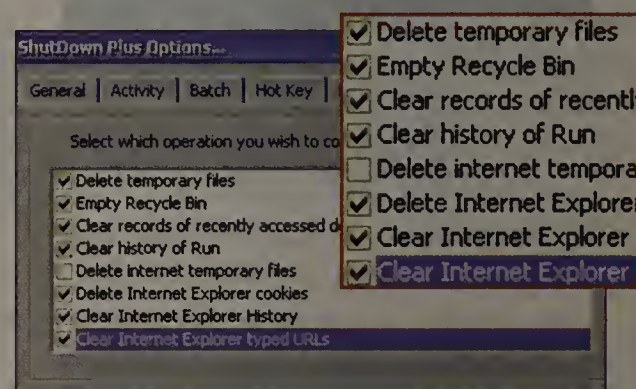
Finally, delete all of the other lines beneath the bracketed heading. When you are finished, you should be left with only the two headings at the top (showing the Registry version and the bracketed Registry path) and one line for each application whose behavior you want to modify (see **FIGURE 4**). Choose **File•Save** to preserve your custom .reg file.

Double-click the Registry export icon and follow the prompts to keep unwanted applications from starting with Windows. To create a shortcut that responds automatically, right-click inside the desired folder (such as the Shutdown folder you created in the previous tip) and choose **New•Shortcut**. In the first

WINDOWS TOOLBOX

Turn Off Your PC Your Way With ShutDown Plus

TURNING OFF YOUR computer needn't be the end of your session with it. ShutDown Plus lets you perform a number of common chores (such as emptying the Recycle Bin, clearing out Internet Explorer's history and typed URLs, erasing the Run history and recent documents, and launching a batch file) before logging off or shutting down your system, or sending it into standby or hibernate mode. A timed shutdown allows you to perform one of these actions at a preprogrammed time. You can shut down remote computers running Windows 2000 or XP, too. Command-line options let you make custom icons for various purposes, but you



need not do this manually; ShutDown Plus can create icons for you from the options on its pop-up menu. For all these features and more, you pay only \$9. Visit find.pcworld.com/41573 to download a demo version. Note that some features are disabled in the demo edition.

box in the Create Shortcut wizard, type **regedit /s** followed by a space and the path to your modified .reg file. So if you stored your file in **C:\Windows\Batch**, your line might read **regedit /s "C:\Windows\Batch\Startup Stopper.reg"** (your path and file name may differ). Use quotation marks if your path contains a space or uses long names. Click **Next**, type a name for your shortcut, and click **Finish**. ■

Send Windows-related questions and tips to scott_dunn@pcworld.com. We pay \$50 for published items. Visit find.pcworld.com/31607 for more Windows Tips. Scott Dunn is a contributing editor for PC World.

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HARDWARE TIPS

KIRK STEERS

KEYBOARD, VIDEO,
MOUSE SHARINGFIRE-BREATHING
FIREWIRE HUBTHREE FREE PC-
TEST UTILITIES

Get the Hard Drive That's Right for You and Your PC

I BOUGHT MY first hard drive—which held an astronomical 20MB of data—back in the early 1980s for more than \$400. The 200GB hard drive I purchased last month cost \$200. That's 10,000 times the



FIGURE 1: SATA CABLES HELP ventilation and are easier to install than PATA cables.

storage for half the price. Wow. But there is a whole lot more than size to consider when shopping for today's hard drives.

INSIDE OR OUTSIDE?

THE FIRST QUESTION to ask when buying a hard drive is: Do I need Windows to boot from the drive? If you don't, consider buying an external hard drive that connects to your PC via FireWire or USB 2.0. Compared with internal drives, they're far easier to install (they just plug into a port in your PC's case). They're also easy to move to another PC, and they keep excessive heat out of your system's innards.

But external drives cost up to twice as much as their internal counterparts. They move data much more slowly than inter-

nal ATA drives, too. If you frequently move massive amounts of data between your applications and your hard disk, you probably want to use an internal drive.

An internal model requires space. Before you shop for a new drive, check for a free drive bay inside your PC. Carelessly jamming the drive into your case may restrict airflow and cause overheating.

SATA OR PATA?

A QUICK GLANCE at any computer store's hard-drive shelf reveals another issue: Do you want a drive using the new Serial ATA interface, or a model using the time-honored Parallel ATA, or EIDE, interface? SATA drives offer faster data transfer speeds and vastly easier installation, among other advantages. They're the obvious choice. Right? Not necessarily.

First, you'll pay a 20 to 40 percent premium for a SATA drive. Next, your system's motherboard has to have SATA connectors. If your PC is more than two years old, it most likely doesn't. (Note that most new PCs and motherboards come with both SATA and PATA connectors.) If your system doesn't have SATA connectors, you can add them via a PCI host adapter card such as Adaptec's \$50 SATA-Connect 1205SA (www.adaptec.com).

The SATA interface bumps up your drive's maximum data transfer speed to 150 megabits per second from current PATA limits of 100 mbps or 133 mbps, but this won't affect the performance of most PCs. The majority of hard drives have a maximum sustained data transfer

rate closer to 80 mbps. Unless you're constantly moving huge files, that slower transfer rate should be more than fast enough for your needs.

On the plus side, SATA installation is a breeze; the 8-wire SATA cables are far narrower than the thick 40- or 80-wire PATA cables that clog the most current PCs' interiors (see **FIGURE 1**). And because each SATA drive connects exclusively to one SATA connector, you needn't set jumpers to master/slave or struggle with many other PATA configuration hassles.

SCOPING THE SPECS

LIKE ANY OTHER PC product, hard drives have various specifications with which you must become familiar. The first number you'll encounter when shopping is the drive's rotation speed. Hard drives rotate at either 5400, 7200, or 10,000 revolutions per minute. Most mainstream hard drives spin at 7200 rpm, but you can save a few dollars (if you don't mind a small drop in data transfer rates) by selecting a 5400-rpm drive.

Like your CPU, your hard drive uses buffer, or cache, memory to speed up data retrieval. Most drives come with either 2MB or 8MB of cache memory. The lower amount should be fine for handling standard PC applications; but if you work with huge spreadsheets or massive image or video files, you'll like the performance increase from 8MB of hard-disk cache.

You'll also see a listing of the drive's access time, which measures how fast the drive locates a given file stored on it. Faster is better, of course, especially if you frequently move many small files—and ►

PC STRESS TEST

SOMETIMES STRESS is a good thing. Pushing your PC to its limits can reveal a hardware problem that might otherwise pop up in the future when you least expect it, and when you can least afford it. Visit find.pcworld.com/41576 to download three utilities that will put your PC's hardware through its paces: PC Stability Test gives your CPU a workout, while Tufftest Lite and BurnInTest check all your PC's components.

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Eustice v. Network Associates, Inc.,
Case No. CIV 210925,

Superior Court of California, County of Ventura.

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Plaintiffs allege that Network Associates has vio-
lated California state law and breached their license
agreements by failing to provide free lifetime updates to
purchasers of versions 3 and/or 4 of McAfee VirusScan
software. Without determining the merits of Plaintiffs'
claims, the Court has ruled that the named Plaintiffs in
this class action may represent the Class described
above.

Each Class member may obtain a coupon for a
free download of the perpetual version of one of the fol-
lowing: (i) McAfee VirusScan version 8, (ii)
AntiSpyware version 1.0 or (iii) QuickClean version
4.01 software from mcafee.com. The coupon will be
available until June 29, 2004. To obtain the coupon, go
to <http://download.mcafee.com/updates/notice/> and
complete an on-line form.

If you wish to be included in this class action,
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Class and may immediately participate in the settle-
ment. However, if you do **NOT** wish to be included in
the Class, you should complete and sign the opt-out form
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and mail it to the attorneys for the Class (identified
below). Alternatively, you may send a letter of your
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you are a member of the Class and that you wish to be
excluded from the Class. Your opt-out form or letter
must be postmarked by June 18, 2004. If you opt-out
of the class action you will not be bound by any Court
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relief granted to the Class.

As a Class member you will be bound by all
orders and judgments of the Court. Class members who
do not validly and timely request to be excluded from
the Class shall be deemed to have released and forever
discharged all of the Settled Claims against Network
Associates.

Under the settlement, Class Counsel will receive
\$227,000 in attorneys' fees, costs and expenses from
Network Associates. Class Members are not personally
liable for any such fees or expenses. You also may seek
the Court's permission to intervene or personally appear
in the class action. If you hire your own attorney, you
must make pay arrangements with that attorney.

On June 29, 2004, the Court will hold a settle-
ment fairness hearing. You may file an objection with
the Clerk of the Ventura County Superior Court and
mail it to Class Counsel no later than June 18, 2004.
Only members of the Class who have submitted timely
written objections will be entitled to be heard at the set-
tlement hearing, unless the Court orders otherwise.

This is only a summary of the proposed settle-
ment. In order to receive a copy of the detailed notice
of the Settlement or a claim form, go to [http://down-
load.mcafee.com/updates/notice/](http://download.mcafee.com/updates/notice/). If you have questions
about this class action or would like a copy of the set-
tlement agreement, you may contact the following attor-
neys for the Plaintiffs and the Class

ROBERT CHATENEVER
WILLIAM JOHN WEILBACHER
ATTORNEYS AT LAW
3639 HARBOR BLVD., SUITE 103
VENTURA, CA 93001
TELEPHONE: (805) 650-6640
FACSIMILE: (805) 650-7765
E-MAIL: naiclassaction@earthlink.net

The proposed settlement and the pleadings filed
in the class action are available for inspection during
business hours at the Superior Court for the County of
Ventura. Please DO NOT telephone the Court concern-
ing this Notice.

April 7, 2004

The Honorable Henry A. Walsh
Judge of California Superior Court
for Ventura County

HERE'S HOW / **HARDWARE TIPS**

I mean dozens or hundreds of files at a
time. For most PC users, though, a faster
access time doesn't have much effect on
a system's overall performance.

Another fairly significant variable is the
drive's data transfer rate. But comparing
the vendor-supplied data transfer rates of
different hard drives can be tricky because
there are several methods of calculation.
Stick to cache size and rotation speed as
guides to a disk's performance.

BIG PROBLEMS

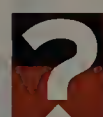
IF YOU TRY to add an ATA hard drive
with a capacity greater than 137GB to a
PC that's more than three years old, you
may run into some configuration difficul-
ties. Older hardware and operating sys-
tems don't recognize more than 137GB.
If you've installed such a model and can't
get Windows to access the entire capaci-
ty, you may need to upgrade your drive
controller, your BIOS, your operating sys-
tem, or possibly all three.

To check your BIOS version, watch for
the version number that shows on your
monitor as your PC boots. If the number
doesn't display, visit [find.pcworld.com/
41321](http://find.pcworld.com/41321) to download Belarc Advisor, which
will provide you with this information
and many other details about your sys-
tem. Next, check your PC or motherboard
documentation, or the PC/board manu-
facturer's Web site, to see if your BIOS
version supports big hard drives. If it
doesn't, look for a BIOS upgrade that

BIOS, you can avoid the entire BIOS
problem by adding an ATA-6 host con-
troller card to an expansion slot of your
PC. You can buy the Maxtor Accessory
PCI Card UDMA 133, for example, for
less than \$30 online.

You'll also need Windows XP with Ser-
vice Pack 1 or Windows 2000 with SP3 to
access more than 137GB on a single
drive, since the original releases of XP
(both Home and Professional editions)
and 2000 won't support big drives. Visit
find.pcworld.com/41324 to download
Windows XP SP1a, and go to [find.
pcworld.com/41327](http://find.
pcworld.com/41327) to obtain Windows
2000 SP3.

SPACE-SAVING KVM SWITCH



IS THERE A WAY to control two or
more PCs with one keyboard, one
mouse, and one monitor? I current-
ly have two complete systems on my desk—
meaning two keyboards, two mice, and two
monitors—and I'd like to add another key-
board, mouse, and monitor for use with my
notebook when it's in its docking station. But
there's just no room on my desk.

Jennifer Smith, Boston

YOU HAVE A COUPLE of ways to solve
your space crunch. The classic solution is
to buy a KVM (keyboard-video-mouse)
switch, which connects multiple PCs to a
single set of mouse, monitor, and key-
board cables. A dial on the box lets you se-
lect which PC you want to control. A two-
port KVM switch that supports two PCs
costs between \$25 and \$50. In your case,
you'll need a four-port switch, which costs
at least twice as much. (Two-port switches
frequently come with cables, while their
four-port counterparts often do not.)

If your PCs are on a standard ethernet
network, however, there's a more elegant
solution. Kavoom (www.kavoom.biz) is a
software KVM switch that lets you use
one PC to remotely control other ma-
chines on the same network, without any
cables or switch boxes. Just click a button
on your screen to effortlessly switch from
one system to the next (see **FIGURE 2**).

Another huge advantage of Kavoom is
remote control: As long as the PC is on a
network, you can control it from any-
where. So if you're using a wireless net-

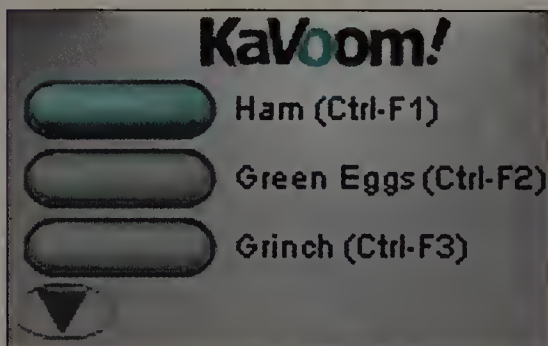


**FIGURE 2: CONTROL TWO OR more PCs
with one mouse, keyboard, and monitor.**

adds such support. Don't consult with the
BIOS manufacturer's site; PC vendors
often customize the BIOS they license,
creating a version specific for their mod-
els, but not for competitors' systems.

If no upgrade is available for your



FIGURE 3: TERRORIZE YOUR desktop with Charismac's FireWire Dino four-port hub.

work, you can stash your extra computers in a closet (assuming you have adequate ventilation) or another room. By contrast, all of the systems that are connected to a hardware KVM switch have to be located within the cables' length of the switch. Kavoom costs \$29 for a two-PC license; add \$10 for each additional machine.

FIRE-BREATHING FIREWIRE

NEED AN ADDITIONAL FireWire port on your notebook or desktop PC? A FireWire hub will expand your single port to two, four, or more. You can find a four-port FireWire hub for less than \$50, but you could also be the envy of every B-movie fan in your office by getting Charismac's \$75 FireWire Dino (previously called Hubzilla, but the name was changed for obvious legal reasons). The product is a four-port FireWire hub housed in a menacing Godzilla-like monster (see **FIGURE 3**).

Be advised, however, that the company's Web site presents this disclaimer: "Charismac claims no responsibility for broken personal or business-related property should FireWire Dino go on a rampage." Oh, no! There goes Tokyo! ■

Go to find.pcworld.com/31511 for past Hardware Tips columns. Send your tips and questions to kirk_steers@pcworld.com. We pay \$50 for published items. Kirk Steers is a PC World contributing editor.

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STEP BY STEP

STAN MIASTKOWSKI

Tune Up Your Windows XP Machine (for Free)

WINDOWS REMINDS ME all too often of those finicky foreign sports cars of decades past. If you don't spend time tweaking, maintaining, and tuning it, it tends to run a little rough. A lot goes on under the hood to keep your XP-based PC running smoothly; but as you add, update,

and delete software and data files, things can get sluggish. XP's built-in tweaking tools can boost your PC's performance.

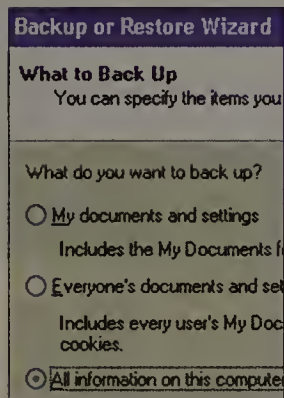
Windows XP has fewer built-in tools than earlier versions of Windows, though the tools available are more full-featured. Other more-sophisticated and automatic

tune-up tools can be found in various suites and stand-alone utilities, as discussed in "The Trouble-Free PC" (find.pcworld.com/40907). But if you're frugal, their cost (up to \$90) may give you pause. XP's built-in tools, along with a few free add-ons, should be sufficient for most users and most situations.

If you're using an earlier version of Windows, consult "Get a Free Tune-Up for Your Windows PC" (find.pcworld.com/41276). And if you're up for a more extensive overhaul, check out "Optimize Your PC for Faster Start-Up Times" (find.pcworld.com/41279) first. ■

Stan Miastkowski is a PC World contributing editor. Contact him at stan_miastkowski@pcworld.com. Visit find.pcworld.com/31676 for past Step-By-Step columns.

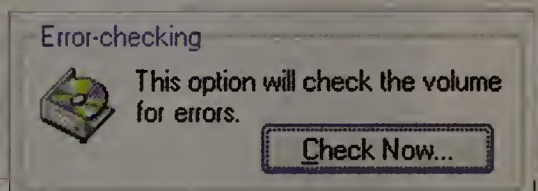
1 Back up your PC. It's essential to perform regular backups of your PC, particularly if you'll be using utilities and tools that make software changes. Unfortunately, Windows XP Home Edition doesn't come with a backup utility. See find.pcworld.com/26704



for downloads that will do the job.

The built-in backup utility in Windows XP Pro is more robust than earlier versions, but it won't back up to a CD-R. It does work with CD-RWs, hard drives, and removable storage.

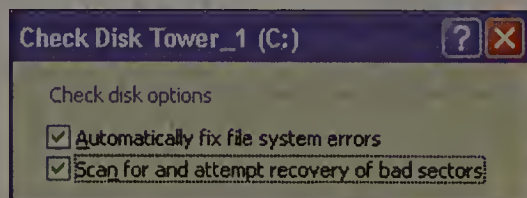
Log in to XP Pro with Administrator privileges, select *Start•All Programs•Accessories•System Tools•Backup*. Step through the various dialog boxes and follow all directions. In the 'What to Back Up' dialog box, choose the *All information on this computer* option if you haven't done a backup before. This will create a floppy that you can use to boot your PC and to restore the backup after a crash.



2 Check hard drives for errors. It's wise to do a thorough check on the status of your hard drives occasionally. Go to *Start•My Computer*, right-click the icon for your C: drive, and choose *Properties*. Then choose the *Tools* tab and click the *Check Now* button. Repeat this step for your other hard drives.

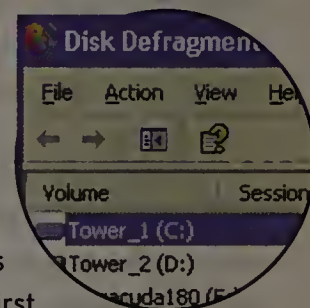
Applications and files must be closed in order for error checking to fix the problems it finds, so XP will often report that the disk check will run the next time you restart your system if you've checked 'Automatically fix file system errors' on the next screen.

Note: Finding and recovering bad sectors can take hours if you have a large drive.



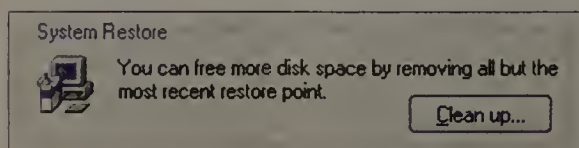
3 Defragment hard drives. The more you use your PC, the more some files become broken into disparate parts scattered around your hard drive. Defragmenting rearranges each file's pieces into a single continuous block for faster access.

You'll need to be logged in as the Administrator to run XP's Disk Defragmenter. First select *Start•All Programs•Accessories•System Tools•Disk Defragmenter*. Highlight the drive that you want to check, and press the *Analyze* button. XP will tell you whether the drive needs to be defragmented. If XP does recommend defragging, click the *Defragment* button.



4 Sack any spyware. A free program like Spybot Search & Destroy (find.pcworld.com/39125) or Ad-aware (find.pcworld.com/33071) can get rid of any freeloading spyware that makes its way onto your system.

5 Clean out unneeded files. Go to *Start•All Programs•Accessories•System Tools•Disk Cleanup*, and select the drive you want to clean. XP will analyze your files and show a list of which ones can be removed. Check the boxes next to the categories you want to discard.



The *More Options* tab offers you several more cleanup choices. The *System Restore* cleanup option, in particular, can clear lots of disk space by erasing old restore points.

6 Back up again. Once you've finished tweaking your system and you're sure that everything is running well, it's a good idea to back up everything once again. That way, you'll always have a clean, fully optimized starting point that you can return to in case a disaster befalls your system.



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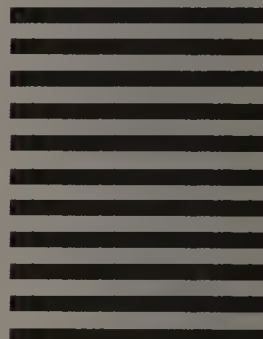
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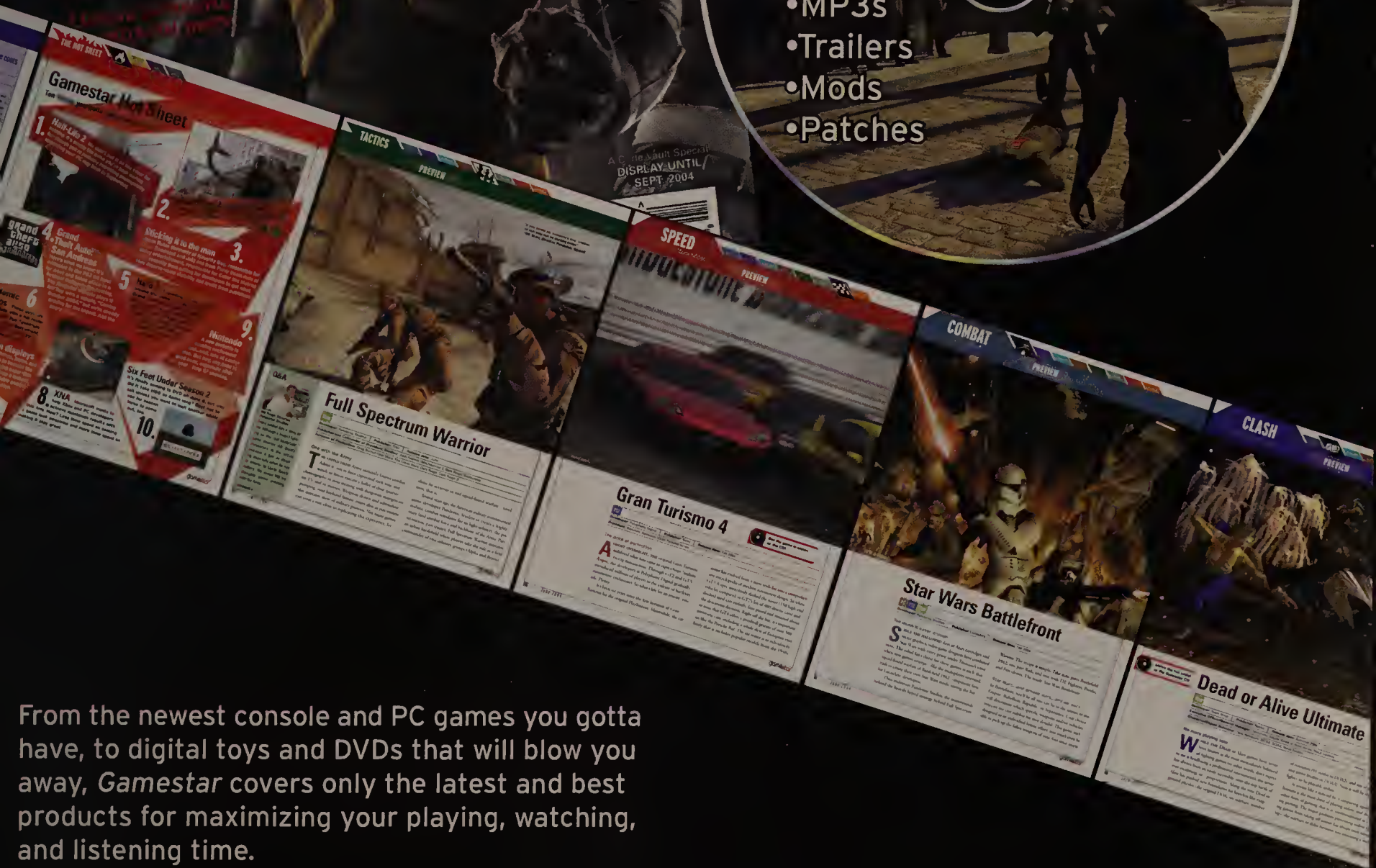
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INTERNET TIPS

SCOTT SPANBAUER

The No-Hassle Guide to Taming America Online

AMERICA ONLINE CAN sometimes feel like a one-size-fits-all service, but there are ways to get more out of this ubiquitous online service, if you know where to look.

Banish pop-ups: AOL 9 adds a useful new feature: Web-page pop-up controls. Too bad it's not enabled by default. To pop the pop-ups, enter the keywords **Pop-up Controls** and check *Suppress pop-ups from Web sites I visit using AOL software* (see **FIGURE 1**). To block AOL's own pop-up ads, check *Suppress AOL member-only special offers*. If you regularly visit Web sites that use pop-ups for log-in, video display, or other non-advertising purposes, enter their URLs one at a time in the text box under 'Allow only these sites' and click *Add*. Once you have added all your exceptions, click *Save*.

Install the AOL version of your choice: The next time you reinstall AOL on your PC, use one of the zillions of free installation discs that the company distributes. Besides containing the latest AOL release, these discs hold many older versions, so you can choose the one whose interface,

features, and memory use you prefer.

Installing the version of your choice isn't always easy, however. Depending on how much memory your computer has, the disc's main setup program may automatically install the latest version, or an earlier one. In my testing, AOL defaulted to installing version 6 on a PC equipped with 48MB of RAM, version 8 on a 64MB system, and version 9 when the system carried 128MB or more of memory.

To get around this auto-install limitation (if your machine has enough memory), put the disc in your CD or DVD drive and hold **<Shift>** while the autostart program begins to run. This will open the disc's directory in Windows Explorer. If the autostart program loads despite these efforts, click *Cancel* to exit the setup program that launches automatically, open Windows Explorer, and select the AOL CD-ROM.

The folders on the AOL CD that contain the different AOL versions (4, 6, 8, and 9 on my disc) are hidden; if you don't see them in Windows 98 SE, choose *View•Folder Options•View*, check *Show all files under Hidden Files*, and click *OK*. To show the hidden files in Windows 2000, Me, and XP, select *Tools•Folder Options•View*, check *Show hidden files and folders* under 'Hidden files and folders', and click *OK*. To install a version of AOL, find its folder (AOL60 or

AOL80, say) and double-click the setup program icon: *setup16.exe* in AOL 4, *setup9x.exe* (for Windows 9x and Me) or *setup2k.exe* (for Windows 2000 and XP) in AOL 6, *setup80.exe* in AOL 8, or *setup90.exe* in AOL 9.

Say bye-bye to AOL Companion: If AOL is a sometime thing for you, you may not need version 9's AOL Companion toolbar, which intrudes (in pop-up style) on your desktop even when you aren't logged on to the service. The toolbar displays a real-time count of your new mail and active instant message conversations (see **FIGURE 2**). Sure, you can click its Close button to get rid of it, but it'll return the

next time you start Windows. To disable AOL Companion permanently, left- or right-click the AOL system tray icon, choose *Auto Start Options*, uncheck *Automatically display AOL Companion*, and click *OK*. To make the system tray icon go away, either left- or right-click it, choose *Exit*, and click *No* in the dialog box that asks 'Do

you want the AOL tray icon to appear next time you start your computer?' ■

Send your questions and tips to nettips@spanbauer.com. We pay \$50 for published items. Go to find.pcworld.com/31523 for more Internet Tips. Scott Spanbauer is a contributing editor for PC World.



FIGURE 2: AOL COMPANION is as handy as it is annoying.

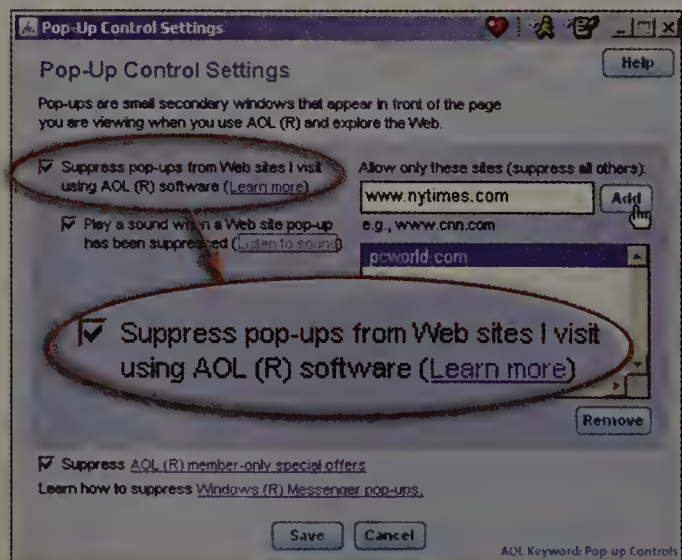


FIGURE 1: AOL 9 BLOCKS POP-UPS, but only if you tell it to do so in the Pop-Up Controls window.

GET YOUR WORDS IN ORDER

WHEN YOU REPLY to an e-mail or news-group message, your response winds up above (top-posted) or below (bottom-posted) the message you're responding to. Both styles have their champions (the Mailing and Posting Etiquette site at find.pcworld.com/40970 illustrates top-posting's flaws). I like bottom posting's conventional chronological flow, but top posting delivers the newest information first. To convert to bottom posting from top posting, move the cursor below the quoted message, and start typing.

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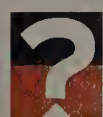
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ANSWER LINE

LINCOLN SPECTOR

Move Your Data, Settings, and Apps to a New PC



THE ACT OF MOVING everything to a new PC is always painful. How should I manage it?

Douglas B. Kuiper, Rock Hill, South Carolina
FIRST, SET UP THE NEW computer near the old one. If you have a network, plug your new computer into it and get it running. The new computer's name on the network must be different from the old one's—at least temporarily. If you can't get the new PC working on your network, visit find.pcworld.com/41342 to read my May column on linking two systems.

If you don't have a network, buy a parallel file-transfer cable (they cost about

way: Spearit Software's Move Me. If you are using a parallel cable to connect the PCs, a program like Move Me is a must—Windows XP's wizard doesn't support parallel links. (Windows provides a workaround via Network Connections, but it's too difficult to bother with.) Move Me has one other advantage: It moves applications, as well as settings and data. Browse to find.pcworld.com/41345 to download Move Me. But before I describe the Move Me approach, let's review the free XP way.

Your old system probably doesn't run Windows XP, and thus lacks the Files and Settings Transfer Wizard. To remedy this, start the new PC and select *Start•All Programs•Accessories•System Tools•Files and Settings Transfer Wizard*. An option early in the process lets you put the wizard itself onto a floppy disk so you can run it on the old computer. (Of course, if your previous system also runs Windows XP, just launch the wizard on that machine.)

A shortcoming of the Files and Settings Transfer Wizard is that it requires you to manually install any applications that are on the old PC but not on the new one. But the wizard does list the programs that you will need to install on the new machine. When you reach this list in the wizard on your old system, install the missing programs on your new machine, and then run the wizard again on that PC.

If you decide to go the Move Me route, install that program on both computers. If all goes well (with migration, there's no guarantee), you won't have to install any other programs on the new system.

Both XP's own migration tool and Move

Me are self-explanatory. Before you use them, close all other programs. Be prepared to switch back and forth between your two computers as you step through the wizards—and be ready to take a break once the transfer begins (see **FIGURE 1**).

THE FINAL TOUCHES

ONCE THE MIGRATION is complete, use your new computer for your everyday PC chores—but keep your old system in place for a couple of days until you're sure that everything you need has made the move. It's inevitable that some important file or program will be left behind (in my tests, neither Move Me nor XP's transfer wizard migrated Word's normal.dot template file, for example). For links to four *PC World* articles on migrating some particularly tricky settings and programs to a new PC, go to find.pcworld.com/41336.

When you finally feel ready to give up your old computer, don't. Stick it in a closet for a couple of months—just to be truly safe. Once it is dusty enough that you can write your name on the case, it's time to sell it, donate it, or give it away. But before you do, visit find.pcworld.com/41339 for instructions on how to wipe its hard drive clean of all its sensitive data. ■

Send your questions to answer@pcworld.com. Answer Line pays \$50 for published items. See find.pcworld.com/31577 for more Answer Line columns. You'll find Contributing Editor Lincoln Spector's humorous writing at www.thelinkinspector.com.

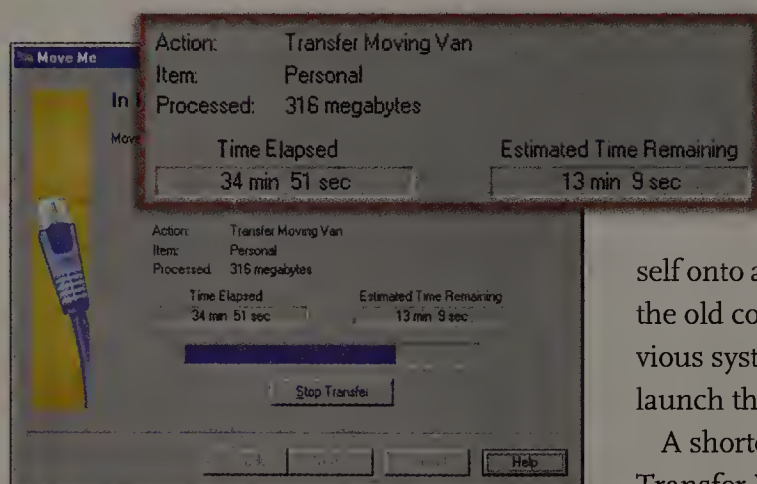


FIGURE 1: MIGRATE YOUR apps, data, and settings with Spearit Software's Move Me.

\$10) to connect the computers via their parallel ports. The connection is slow, but if you transfer at the end of the workday, it should be complete by morning.

MIGRATION PATTERNS

WITH THE TWO MACHINES connected, pick a migration technique. Windows XP's Files and Settings Transfer Wizard does a good job of moving your data, but for \$20 per migration, there's a better

ALPHABETIZE IE FAVORITES

WHEN YOU ADD a new Web page to Internet Explorer's Favorites menu, the program places it beneath the other items. Fred Mehlos of Grafton, Wisconsin, asks how to alphabetize this chronological list of pages. The answer is simple: Right-click any item on the menu, and select *Sort by Name*. This sorting, unfortunately, doesn't affect the contents of submenus; you'll have to repeat this process for each submenu you want sorted. Alternatively, you can manually sort the menus by dragging items up and down to place your favorite sites at the top.

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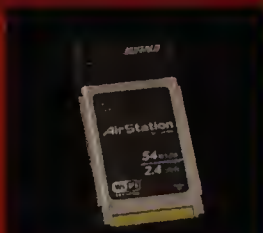
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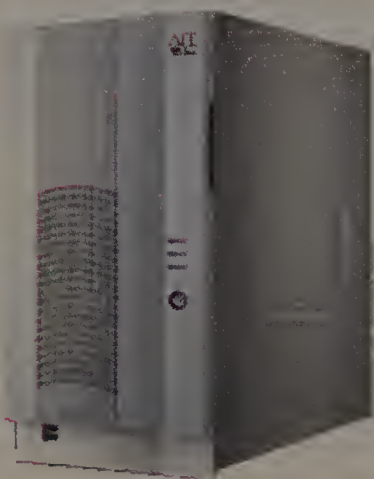
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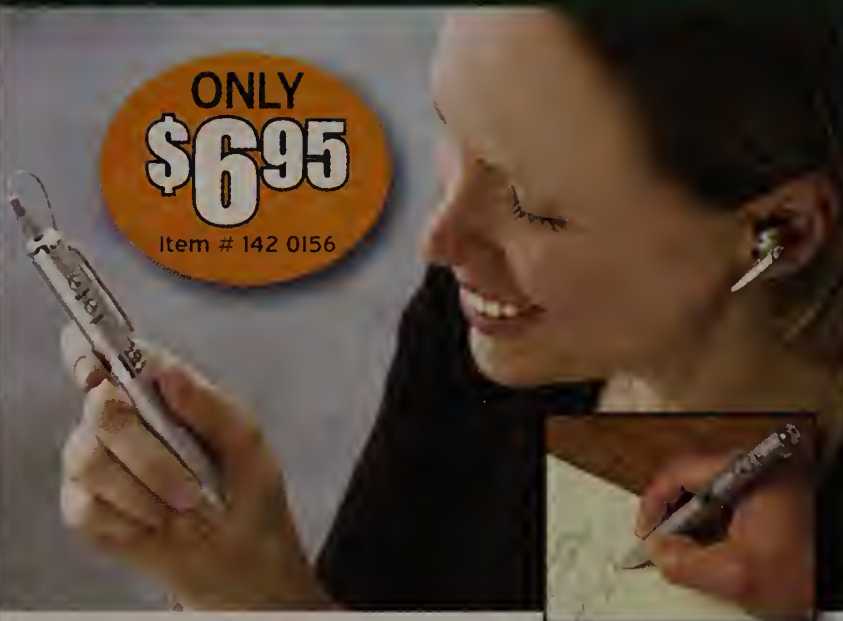
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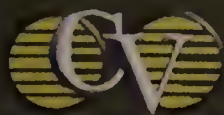
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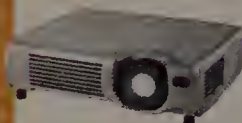


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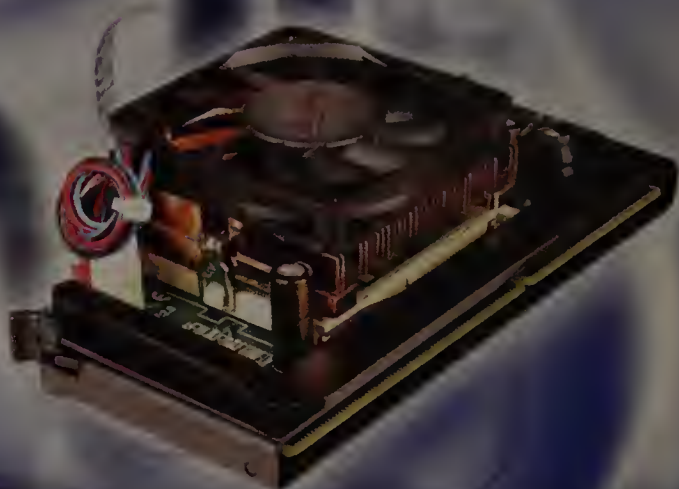

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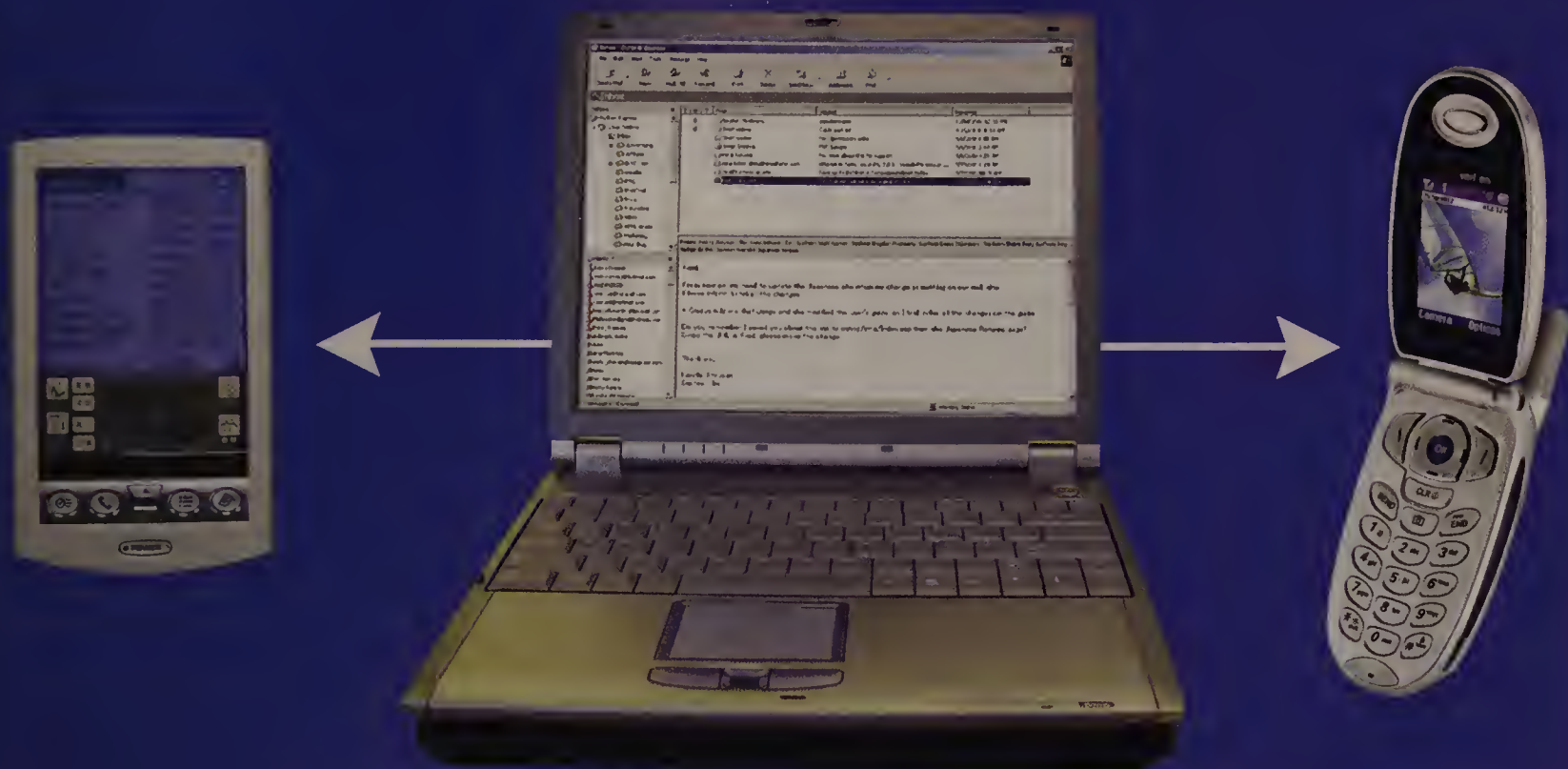


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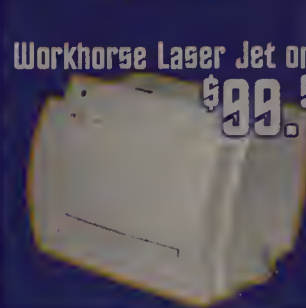
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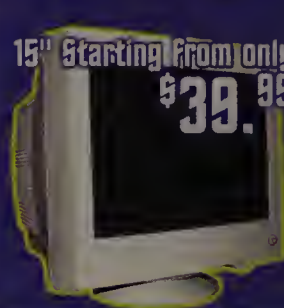
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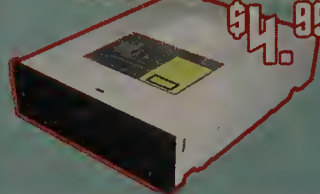
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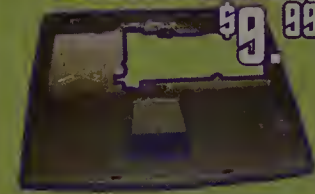
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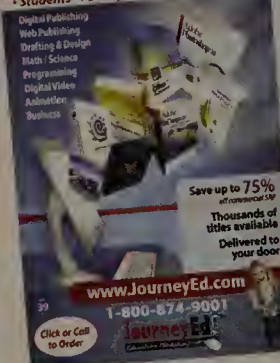


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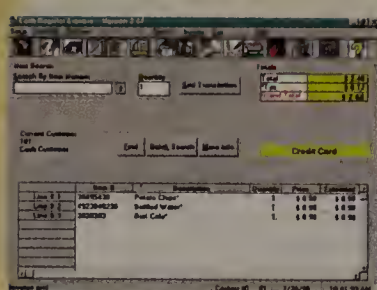
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Help Fix Microsoft's Next Windows!

A FEW WEEKS AGO Microsoft invited a bunch of journalists to dinner with a couple of its Windows honchos, including Jim Allchin, "Mr. Longhorn." Allchin asked what we'd like to see in that forthcoming-someday version of Windows. So I put in my 2 cents. Okay, maybe a quarter.

I started with startup. How come both of my Win XP machines sometimes display a log-in field into which I can type my password—but when I do, Windows demands that I click my icon and retype my password? Why should your very first daily experience with the OS have to be so awful? Allchin nodded sagely and hinted that Longhorn's new graphics engine would change that. Good.

Somebody mentioned how hard it is to switch from an old PC to a new one. Allchin extolled the Files and Settings Transfer Wizard—which I pointed out doesn't always work and doesn't move programs. The latter problem, it appears, will not be solved. But at least Allchin implied that upgrading to Longhorn would be easier than the maddening track from 98 or Me to XP.

Things got downright disappointing when I turned to Longhorn's new search features. When I asked whether the indexing service would work better than XP's, which mostly serves as a way of slowing your machine to a crawl, Allchin mumbled something to the effect that not everybody would use it. When I asked whether we'd be able to use Windows' search tool to find individual e-mail messages, Allchin said that was the intention—implying that it may not actually happen.

And after Microsoft "retired" Office's animated paper clip helper with much fanfare (even though it's still around), why did Windows 2000's usable search function go to the dogs—or at least to Windows XP's animated pooch? I got Allchin to commit to eliminating the bastard pup of Microsoft Bob. But just in case Jim has second thoughts, I'm starting a campaign. If you care about this, send e-mail to killdoggie@pcworld.com, and we'll forward it to him.

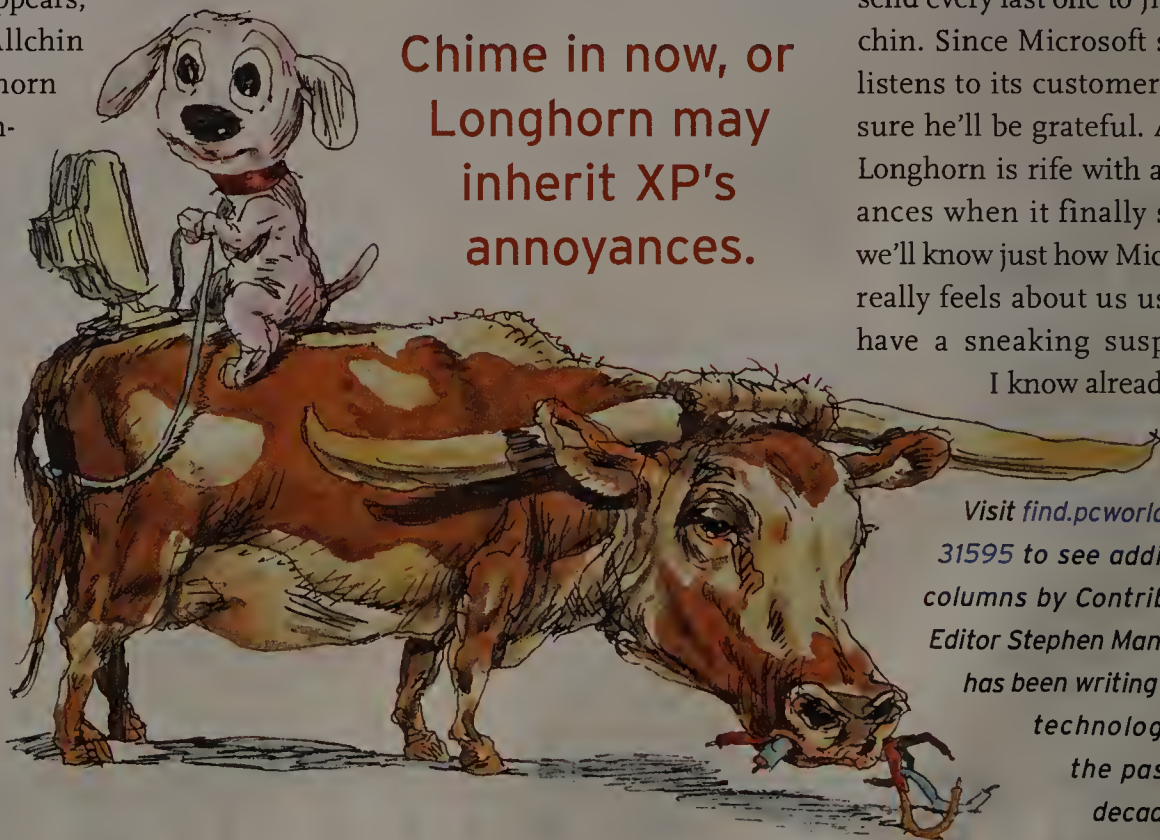
Given that Longhorn will sport yet another makeover, I asked whether the Classic View for the desktop, Start menu,

and folders would survive. Allchin's "yes" turned out to refer not to the interface we've known since Windows 95, but to the screen-wasting XP look—which is what he seemed to think was on most people's machines. But a quick poll revealed that though Microsoft's people were using XP in its default mode, only one out of five reporters was—in part because several were still in the pre-XP world. I suggested that Allchin ought to reconsider trashing the best-known version of the Windows interface. He said he'd think about it. If you don't want Microsoft to ditch the Classic interface, send your vote to saveclassic@pcworld.com and we'll forward it, as well.

I have lots of ideas on how to fix Windows, and I bet you do, too. So send your grievances to fixwindows@pcworld.com. We'll publish the most egregious—and

send every last one to Jim Allchin. Since Microsoft says it listens to its customers, I'm sure he'll be grateful. And if Longhorn is rife with annoyances when it finally ships, we'll know just how Microsoft really feels about us users. I have a sneaking suspicion I know already. ■

Chime in now, or Longhorn may inherit XP's annoyances.



Visit find.pcworld.com/31595 to see additional columns by Contributing Editor Stephen Manes. He has been writing about technology for the past two decades.



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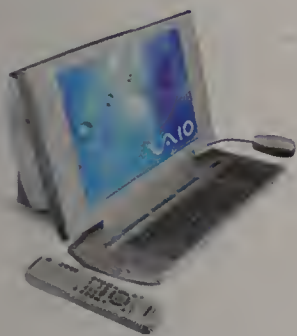
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